

OCTOBER • 1935



Gas Measurement Committee Report No. 2

Publication has been completed and copies of Report No. 2, Gas Measurement Committee, Natural Gas Department, A. G. A., are now available.

The report is in code form, covering meter coefficients, and, together with its separately bound appendix, is in the handy $3\frac{7}{8} \times 6\frac{3}{4}$ -inch size, punched to fit the standard loose leaf ring book of that dimension. The report is fifty pages and the appendix sixteen pages. Eight fold-over pages are devoted to tables of Reynolds' Number Factors—Flange Taps and three fold-over pages show tables of Expansion Factors—Flange Taps.

Copies can be obtained from A. G. A. Headquarters, 420 Lexington Ave., New York, or Natural Gas Department, A. G. A., 709 Dallas Gas Bldg., Dallas, Texas, at 50 cents each. For orders of more than ten at one time the price is three for one dollar.

AMERICAN GAS ASSOCIATION MONTHLY

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Convention City—1935

AMERICAN GAS ASSOCIATION MONTHLY

James M. Beall, Editor

Chicago Convention Offers Well-Balanced Program

ALL preparations have been completed for the staging of the Association's seventeenth annual convention at the Palmer House, Chicago. The important opening date is Monday, October 14, and the final curtain falls Thursday, October 17.

Every member of the gas fraternity will find something of tangible benefit for him at the convention. If he desires a good over-all viewpoint of gas industry conditions in general, plus a broad-visioned analysis of the current pulse of business, he will find his answer in the three General Sessions. If he wants orientation on some particular subject or desires to contribute personally out of his own experience to a discussion of vital plans and problems, he will find himself welcome in the various sectional meetings. And, finally, if he is looking also for a good time he will discover his wishes already have been anticipated by the Entertainment Committee. In short, everything that has made previous A. G. A. conventions conspicuously successful will be on tap for those in attendance.

Special trains have been chartered to bring delegates from all parts of the country. Advance reports indicate there will be several thousand registered when President Young calls the first General Session to order Tuesday morning in the Grand Ball Room of the Palmer House.

Events begin with the meeting of the Main Technical and Research Committee of the Natural Gas Department

on Monday morning, October 14. The Department will continue in session throughout the afternoon of that day and its executive heads will hold their annual meeting and dinner in the evening.

Outstanding on the Natural Gas Department program will be discussions of two of the most urgent problems facing the industry today: General Problems of Taxation and Legislation, and Building the Natural Gas Load. The first will be led by R. D. Garver, counsel of the Gas Service Company, Kansas City, and the sec-

ond by Walter C. Beckjord, vice-president and general manager, Columbia Gas & Electric Corporation, Pittsburgh. Valuable contributions by other speakers will be made on each of these subjects.

One of the high spots of the convention is expected to be the address of Harper Sibley, president of the Chamber of Commerce of the United States, who will appear at the Wednesday General Session. Mr. Sibley, who was born in New York City and educated at Groton and Harvard, has been the spearhead of business management in an effort to prevent unnecessary Federal encroachments on private industry. His extensive connections in agriculture, banking, mining and lumbering before his election as President of the Chamber of Commerce give him a particularly broad view of present-day problems. As the voice of organized business, his words carry additional weight.

George E. Whitwell of Philadelphia, A. F. Bridge of Los Angeles and John A. Fry of Detroit, will be speakers at the Thursday morning General Session at which time the tenth annual celebration of the A. G. A. Laboratory will be held. A special stage display featuring the Laboratory's ten years of activity will be erected and Mr. Whitwell in his address will use this display for pointing out certain pertinent facts about the Laboratory's progress to date. There will also be ready for distribution at the convention a comprehensive tenth anniversary re-



President Young



Grand Ball Room—Setting for the General Sessions and entertainment functions

port of the Laboratory, sketching in detail its activities and its testing program from the date it was inaugurated.

Other speakers at the General Sessions whose addresses are expected to attract widespread attention are F. A. Newton of New York, George F. Mitchell of Chicago, and Dr. Cecil K. Drinker, of the Harvard School of Public Health. These will be supplemented by a discussion on "Changing Rate Structures" by H. H. Agee, chairman of the Rate Structure Committee, and an address on "Increasing Sales per Domestic Consumer," by George N. Wallace of Minneapolis. J. F. Quinn, chairman of the Industrial Gas Section, and C. A. Harrison, chairman of the Technical Section, in addition to leading their sectional programs, will appear on the General Sessions program.

A special feature of this year's convention will be the showing of a three-reel sound motion picture film, "A Cycle of Service," produced by the Public Service Corporation of New Jersey. The picture is a dramatic conception of the vast human labor and mechanical energy necessary to furnish gas, electricity and transportation each day of the year to 415 municipalities in the State of New Jersey.

The film embodies all the newest developments in the art of motion picture production relative to photog-

raphy, lighting, sound recording, optical effect and music. A separate musical score was composed for each of the reels and played by thirty members of the New York Symphony Orchestra. The picture presents its own story comparatively free of titles, labels, definitions or minute details of operation.

It is planned to show the picture in its entirety in the Grand Ball Room of the Palmer House following the

second General Session, Wednesday, October 16. The gas portion of the film will be shown during the final General Session, Thursday morning.

In view of recent developments the discussion of the radio program as an advertising medium by Henry Obermeyer, chairman of the Publicity and Advertising Committee, on Thursday morning, is of timely importance. Not only are many individual gas companies going on the air for the first time but plans are rapidly being consummated for a regional hookup on the eastern seaboard involving numerous companies and millions of meters. It is expected that Mr. Obermeyer will have an important announcement to make at the convention.

Another subject of general interest at this time, that of direct mail advertising, will be analyzed at the advertising luncheon symposium by Leonard J. Raymond, president of the Direct Mail Advertising Association. Mr. Raymond is head of Dickie-Raymond, Inc., Boston, an organization engaged in merchandising and sales promotion work and specializing in direct advertising.

Of particular interest to both manufactured and natural gas companies will be the paper to be presented by L. J. Willien on developments in gas making processes for peak loads. Mr.

RADIO PROGRAM

As this issue of THE MONTHLY goes to press, gas companies situated in the territory from Washington, D. C., to Portland, Maine, and from New York City to Buffalo, New York, are ready to announce the launching of a cooperative radio program designed to create a strong consumer preference for gas fuel for cooking, refrigeration, water heating and house heating, with emphasis on cooking.

Henry Obermeyer, chairman of the Association's Publicity and Advertising Committee, will announce the latest developments in this program at the general session at Chicago, Thursday morning, October 17. Further discussion of the program will be held at the advertising luncheon symposium on Thursday afternoon.

Two morning broadcasts a week over thirteen NBC stations on the Red Network are proposed. There are 6,000,000 domestic gas meters in the territory to be reached, which embraces New York, New Jersey, Eastern Pennsylvania, District of Columbia, Connecticut, Massachusetts, Delaware, Maryland, New Hampshire, Vermont, Maine and Rhode Island. In the early stages of the project the companies agreed that unless 75 per cent of the domestic meters in the territory—4,500,000 meters—supported the movement, it would be dropped. At this writing favorable word has been received from companies whose meters number in excess of 4,700,000. The date for the opening broadcast has been tentatively set for November 1.

The sole talent featured on the program will be John Macpherson, popularly known to millions of radio listeners as "The Mystery Chef." A book containing Mr. Macpherson's favorite recipes will be offered free of charge to all listeners situated in the territory who make application in writing to their gas companies.

Headliners on General Sessions Program



Harper Sibley



Dr. C. K. Drinker



George F. Mitchell



F. A. Newton



G. E. Whitwell

Willien will present an up-to-date review of all recognized processes including not only the standard gases, such as coal gas, carburetted water gas and natural gas but also butane and its ramifications and standardized processes of making gas from oil.

Appearing on the Technical Section program for the first time will be a symposium on the "Employees' Part in Increasing Gas Usage and Appliance Sales" designed to bring out the benefits of employee selling from an operator's viewpoint. This will be summarized at the General Session, Wednesday morning. A valuable contribution to this program will be a review by Dr. Scott Ewing, A. G. A. research associate, covering his experiences in the field this past year, during which he discussed with various companies their peculiar corrosion problems.

Two facts merit particular attention in relation to the Industrial Gas Section meetings. The first is a luncheon to be held on Tuesday preceding the business meeting. The purpose of the luncheon is to afford an opportunity to industrial men from all over the country to become better acquainted, and it is hoped that this prior association will stimulate full discussion at the meetings. The second is the Commercial Gas Sales Symposium on Thursday, where for the first time recognition will be given to that important market.

In the field of accountancy many new developments in recent months assure an interesting and worth-while program. In addition to comprehensive reports of committees, the luncheon conferences which were received enthusiastically last year, will

be repeated. Of special interest to the natural gas accountants is a paper to be presented by C. P. Read, general auditor of the Northern Natural Gas Company, Omaha, on "Standardization of Accounting Instructions, Forms and Procedures for Natural Gas Companies."

Following is the tentative program of general and sectional meetings:

GENERAL SESSIONS

TUESDAY MORNING, OCTOBER 15

10:00 o'clock

Grand Ball Room

Call to Order

PRESIDENT P. S. YOUNG, Newark.

Welcome to Chicago

MAYOR KELLY.

The Association's Finances

JOSEPH F. ROONEY, *Treasurer*, New York.

Association Activities

ALEXANDER FORWARD, *Managing Director*.

Report of General Nominating Committee

D. D. BARNUM, Boston.

Election of Officers

Effective Administration of Resuscitation—Twelve Years' Experience

CECIL K. DRINKER, M.D., Harvard University School of Public Health.

Caring for Peak Loads (Summary)

L. J. WILLIEN, Chicago.

Presidential Address

P. S. YOUNG, Newark.



Red Lacquer Room which will be used for Natural Gas Department and some of the Sectional meetings

12:00 Noon

Executive Session

(Only company member delegates are eligible to attend.)

- Election of Company Members.
- Election of Directors.
- Election of General Nominating Committee.
- Election of Committee on Resolutions.

WEDNESDAY MORNING, OCTOBER 16

10:00 o'clock

Grand Ball Room

Changing Rate Structures

H. H. AGEE, *Chairman*, Rate Structure Committee.

Increasing Sales Per Domestic Consumer

GEORGE N. WALLACE, Minneapolis.

Extending Commercial Business

J. F. QUINN, Brooklyn.

Employees' Part in Selling Gas and Appliances (Summary)

C. A. HARRISON, New York.

Presentation of Awards

- Charles A. Munroe Award—CHARLES A. MUNROE, New York.
- Beal Medal—PRESIDENT YOUNG, Newark.
- Prosperity Cups—F. M. ROSENKRANS, Kansas City.

The Chamber of Commerce and American Business

HARPER SIBLEY, *President*, Chamber of Commerce of the United States.

THURSDAY MORNING, OCTOBER 17

10:00 o'clock

Grand Ball Room

Tenth Anniversary Celebration of the American Gas Association Laboratory

- GEORGE E. WHITWELL, Philadelphia.
- A. F. BRIDGE, Los Angeles.
- JOHN A. FRY, Detroit.

Showing of Film—Service

The Radio Program

HENRY OBERMEYER, New York.

The Challenge to the Gas Industry

F. A. NEWTON, New York.

Industrial and Commercial Selling

GEORGE F. MITCHELL, Chicago.

Resolutions

Time and Place 1936 Convention

NATURAL GAS DEPARTMENT

MONDAY MORNING, OCTOBER 14

9:30 o'clock

Red Lacquer Room

Annual Meeting Main Technical and Research Committee

H. C. COOPER, *Chairman*, Hope Natural Gas Company, Pittsburgh, Pa.

MONDAY AFTERNOON

1:30 o'clock

Red Lacquer Room



J. B. Tonkin

Company, Pittsburgh, Pa.

Report of Nominating Committee

FRANK L. CHASE, *Chairman*, Lone Star Gas Company, Dallas, Texas.

Election of Officers

General Problems of Taxation and Legislation

Discussion led by:
R. D. GARVER, Gas Service Company, Kansas City, Mo.

Building the Natural Gas Load

Discussion led by:
WALTER C. BECKJORD, Columbia Gas and Electric Corporation, Pittsburgh, Pa.

Closing Remarks and Adjournment

MONDAY EVENING

6:30 o'clock

Annual Meeting and Dinner of the Executive, Managing and Advisory Committees

ACCOUNTING

TUESDAY AFTERNOON, OCTOBER 15

2:00 o'clock

Exhibition Hall



A. S. Corson

Address of Chairman

A. S. CORSON,
The United
Gas Improve-
ment Co., Phila-
delphia, Pa.

Report of Nominating Committee

E. B. NUTT,
Chairman,
Standard Oil
Company of

New Jersey, New York, N. Y.

Election of Officers

Affiliated Representatives Committee

F. L. GRIFFITH, *Chairman*, The Peoples Gas Light & Coke Co., Chicago, Ill.

Compendium Committee

C. J. FUE, *Chairman*, The Brooklyn Union Gas Company, Brooklyn, N. Y.

Luncheon Conferences Committee

H. A. EHRLMANN, *Chairman*, Consolidated Gas Co. of New York, New York, N. Y.

General Accounting Committee

WM. F. R. MUNNICH, *Chairman*, Philadelphia Electric Company, Philadelphia, Pa.

(a) Machine Posting—General Accounting

WM. F. R. MUNNICH, Philadelphia, Pa.

(b) Production Accounts—Comparative Practices

J. A. SCHULTZ, *Chairman*, Reading, Pa.

(c) Work Orders in Budgetary Control

W. J. MAGUIRE, *Chairman*, Philadelphia, Pa.

Office Management Committee

G. B. WEBBER,
Chairman, Public Service Electric & Gas Co., Newark, N. J.

(a) Eliminating Clerical Waste

HAROLD S. RAND,
Chairman, Worcester, Mass.



G. B. Webber

Prominent Men To Speak at Annual Convention

*R. D. Garver**Herman Russell**Frank Lovejoy**L. J. Raymond**A. F. Bridge**H. C. Cooper**L. J. Willien**W. C. Beckjord**C. J. Fae**F. L. Chase**C. E. Paige**K. B. Nagler**Clara G. Snyder**Frank H. Adams**Wm. F. R. Münnich**J. R. Pershall**Floyd Parsons**M. E. Skinner**T. S. Lever**Hale A. Clark**R. L. Manier**P. T. Dasbiell**S. B. Severson**E. J. Boyer**C. E. Lucke, Jr.*

- (b) Commercial Correspondence
WESLEY N. GEITER, *Chairman*,
New York, N. Y.

Standardization of Accounting Instructions, Forms and Procedures for Natural Gas Companies*

C. P. READ, *Northern Natural Gas Company*, Omaha, Neb.

Accounting Machines Committee

T. S. LEVER, *Chairman*, The Philadelphia Gas Works Co., Philadelphia, Pa.

- (a) Accounting Machine Developments

T. S. LEVER, Philadelphia, Pa.

- (b) Customers' Accounting System—Public Service Electric & Gas Co.

JOHN L. CONOVER, Newark, N. J.

WEDNESDAY AFTERNOON

OCTOBER 16

12:30 o'clock

Accounting Section Luncheon Conferences

Four luncheons will be held simultaneously promptly at 12:30 p.m., as follows:

Customer Accounting.
Customer Relations.
General Accounting.
Office Management.

THURSDAY AFTERNOON, OCTOBER 17

2:00 o'clock

Exhibition Hall



F. L. Griffith

Uniform Classification of Accounts Committee

F. L. GRIFFITH, *Chairman*, The Peoples Gas Light & Coke Co., Chicago, Ill.

Customer Accounting Committee

L. A. MAYO, *Chairman*, Connecticut Light & Power Company, Hartford, Conn.

- (a) Trends in Billing Systems

W. E. SCOTT, *Chairman*, Boston, Mass.

* Contribution of Natural Gas Representatives Committee—F. W. Peters, *Chairman*, Oklahoma Natural Gas Co., Tulsa, Okla.

- (b) Control of Customers' Accounting Procedures

G. I. SIMPSON, *Chairman*, Chicago, Ill.

- (c) Credit History Records

W. A. HILL, *Chairman*, Wilmington, Del.

Customer Relations Committee

H. T. EAST, *Chairman*, Public Service Co. of Northern Ill., Chicago, Ill.

- (a) Training Employees for Good Will Building

W. C. TERRY, *Chairman*, Nashville, Tenn.

- (b) Ascertaining Customers' Views and Requirements

R. T. DUDREAR, Philadelphia, Pa.

Closing Remarks

H. M. BRUNDAGE, New York, N. Y.

ADVERTISING

LUNCHEON SYMPOSIUM

Publicity and Advertising Committee

THURSDAY AFTERNOON, OCTOBER 17

12:30 o'clock

Club Lounge

(Tickets must be purchased by 9 a.m. Thursday, October 17, at A.G.A. Registration Desk. Tickets \$1.25. All delegates to the Convention and all members of the Public Utilities Advertising Association are invited to this Symposium.)

Presiding

HENRY OBERMEYER, *Chairman*, Publicity and Advertising Committee, American Gas Association.

J. R. PERSHALL, *President*, Public Utilities Advertising Association.



H. Obermeyer

An Analysis of Gas Company

Mailing List Methods

LEONARD J. RAYMOND, *President*, Direct Mail Advertising Association, Inc.

Discussion

Present Prospects for Radio Advertising.

A Plan for National Cooperative Advertising.

Public Utility Advertising—Status and Trends.

COMMERCIAL

TUESDAY AFTERNOON, OCTOBER 15

2:00 o'clock

Grand Ball Room



F. M. Rosenkrans

Address of Chairman

F. M. ROSENKRANS, *Gas Service Co.*, Kansas City, Mo.

Report of Nominating Committee

N. T. SELLMAN, *Chairman*, Consolidated Gas Co. of

New York, New York, N. Y.

Election of Officers

Scanning the Industry's Future

FLOYD PARSONS, *Robbins Publishing Co.*, New York, N. Y.

What the Range Contest Accomplished for a Prize Winning Company

W. H. MCINNIS, *Memphis Power & Light Co.*, Memphis, Tenn.

What the Range Contest Accomplished for the Supporting Range Manufacturers

W. E. DERWENT, *Geo. D. Roper Corp.*, Rockford, Ill.

Economics of Securing the House Heating Load

HERMAN RUSSELL, *Rochester Gas & Electric Corp.*, Rochester, N. Y.

WEDNESDAY AFTERNOON

OCTOBER 16

2:00 o'clock

Grand Ball Room

Today's Selling Trends

FRANK LOVEJOY, *Socony Vacuum Corp.*, New York, N. Y.

Essentials for Successful Water Heating Sales in 1936

E. J. BOYER, *Minneapolis Gas Light Co.*, Minneapolis, Minn.

W. T. RASCH, *American Gas Products Corp.*, New York, N. Y.

Long Term Financing of Appliance Sales

MERRILL E. SKINNER, *Niagara-Hudson Power Corp.*, Buffalo, N. Y.

Specialty Selling and the Gas Industry Speaker to be announced.

Home Service Avenues to Greater Sales

W. C. GRANT, *Lone Star Gas Co.*, Dallas, Texas.

HOME SERVICE

BREAKFAST MEETING

WEDNESDAY MORNING

OCTOBER 16

8:30 o'clock

Room No. 10

(Purchase tickets by 5:00 p.m., Tuesday, October 15, at A. G. A. Registration Desk. Tickets \$1.25.)



Address of Chairman

MARGARET NEVINS, The Syracuse Lighting Company, Inc., Syracuse, N. Y.

Greetings

P. S. YOUNG, President and ALEXANDER

Miss Nevins

FORWARD, Managing Director, American Gas Association.

Impressions of Home Service from the Chairman of the Commercial Section

F. M. ROSENKRANS, The Gas Service Company, Kansas City, Mo.

Group of two-minute talks on Home Service Activities:

Value of New Platform Kitchens

MRS. ANNA J. PETERSON, The Peoples Gas Light & Coke Company, Chicago, Ill.

Starting a Home Service Department

LULU TREGONING, Kansas City Gas Company, Kansas City, Mo.

Reaching a Wide Territory of Small Communities

MILDRED R. CLARK, Oklahoma Natural Gas Co., Tulsa, Okla.

Sales Floor Demonstration

RUTH KRUGER, Bronx Gas & Electric Co., Bronx, N. Y.

Cooperation Through Employee Groups

HELEN DIAMOND, Minneapolis Gas Light Co., Minneapolis, Minn.

House Heating Sales Promotion—A Skit

HELEN SMITH, Rochester Gas & Electric Corp., Rochester, N. Y.

TUESDAY AFTERNOON, OCTOBER 15

4:00 o'clock

Club Lounge

New Methods of Poultry and Egg Cookery

Institute of American Poultry Industries, CLARA GEBHARD SNYDER, Chicago, Ill.

Readers' Inquiries on Water Heating and Refrigeration

JOHN NORMILE, Better Homes and Gardens, Des Moines, Iowa.

Home Service Question Box

Round Table Discussion.

INDUSTRIAL GAS

LUNCHEON

TUESDAY AFTERNOON, OCTOBER 15

12:30 o'clock

Club Lounge



J. F. Quinn

Presiding

H. O. LOEBELL, Natural Gas Pipe Line Co. of America, Chicago, Ill.

Speaker

CLIFFORD E. PAIGE, The Brooklyn Union Gas Co., Brooklyn, N. Y.

TUESDAY AFTERNOON, OCTOBER 15

2:00 o'clock

Room No. 10

Address of Chairman

J. F. QUINN, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Report of Nominating Committee

F. B. JONES, Chairman, Equitable Gas Co., Pittsburgh, Pa.

Election of Officers

Raising the Public's Evaluation of Gas

FRANK H. ADAMS, Surface Combustion Corp., Toledo, Ohio.

Advertising Industrial Gas

GEORGE KETCHUM, Ketchum, MacLeod & Grove, Pittsburgh, Pa.

WEDNESDAY AFTERNOON

OCTOBER 16

2:00 o'clock

Room No. 10

INDUSTRIAL GAS SALES SYMPOSIUM

C. W. GALE presiding.

The Food Industry

FRANK H. TREMBLY, Jr., The Philadelphia Gas Works Co., Philadelphia, Pa.

The Ferrous Metal Industry

HALE A. CLARK, Detroit City Gas Co., Detroit, Mich.

The Non-Ferrous Metal Industry

RALPH L. MANIER, Syracuse Lighting Co., Syracuse, N. Y.

The Ceramic Industry

HARVEY C. WELLER, Surface Combustion Corp., Toledo, Ohio.

THURSDAY AFTERNOON, OCTOBER 17

2:00 o'clock

Room No. 10

COMMERCIAL GAS SALES CONFERENCE

H. A. SUTTON presiding.

Hotels, Restaurants, Institutions

T. J. GALLAGHER, The Peoples Gas Light & Coke Co., Chicago, Ill.

Bake Shops and Delicatessens

R. H. STANIFORD, The Brooklyn Union Gas Co., Brooklyn, N. Y.

Pressing, Cleaning and Dyeing Establishments

H. E. G. WATSON, Consumers Gas Co. of Toronto, Toronto, Ont., Canada.

Dealer Cooperation in the Sale of Commercial Gas Appliances

CHARLES E. LUCKE, Jr., Consolidated Gas Co. of New York, New York, N. Y.

Friday, October 18, 10:00 A.M.

Palmer House

MIDWEST INDUSTRIAL GAS SALES COUNCIL

Round Table Discussion of Experiences in the Sale of Industrial Gas

MANUFACTURERS

MONDAY MORNING, OCTOBER 14

10:00 o'clock

Room No. 10

Report of the
Chairman

JOHN A. FRY,
President, De-
troit Michigan
Stove Co., De-
troit, Mich.



J. A. Fry

ORGANIZATION MEETING

Association of Gas Appliance and Equip-
ment Manufacturers

TECHNICAL

TUESDAY AFTERNOON, OCTOBER 15

2:00 o'clock

Red Lacquer Room

Address of Chairman

C. A. HARRI-
SON, Henry L.
Doherty & Co.,
New York,
N. Y.

Report of Nomi-
nating Commit-
tee

O. S. HAGER-
MAN, Chair-
man, American
Light & Trac-
tion Co., Chi-
cago, Ill.



C. A. Harrison

Election of Officers

Symposium: Employee's Part in In-
creasing Gas Usage and Appliance
Sales

(a) Employees' Sales Promotion
Plan

J. H. BRAINE, Brooklyn Union
Gas Company, Brooklyn, N. Y.

(b) Every Employee a Business
Builder

WARREN R. SISSON, Ohio Fuel
Gas Company, Columbus, Ohio.

(c) Employee Selling from an Op-
erator's Viewpoint

S. B. SEVERSON, Vice-President
and General Manager, Republic
Light Heat & Power Co., Buffalo,
N. Y.

Corrosion Research in the Field

DR. SCOTT EWING, A.G.A. Research
Associate, U. S. Bureau of Standards,
Washington, D. C.

WEDNESDAY AFTERNOON

OCTOBER 16

2:00 o'clock

Red Lacquer Room

Relation of Carbonizing Temperature
and Rank of Coal to the Reactivity,
Electrical Conductivity and Hygro-
scopicity of Coke

J. D. DAVIS and A. C. FIELDNER, U. S.
Bureau of Mines, Washington, D. C.

Corrosion Resisting Materials for Gas
Appliances

A. L. WARD and W. H. FULWEILER,
The United Gas Improvement Co.,
Philadelphia, Pa.

Gas Engineering Flow Formulae and
the Reynolds Number

DRS. WILBERT J. HUFF and LLOYD
LOGAN, Department of Gas Engineer-
ing, Johns Hopkins University, Balti-
more, Md.

Committee Reports

Chemical Committee

S. S. TOMKINS, Chairman, Consoli-
dated Gas Company of New York,
New York, N. Y.

Distribution Committee

ERICK LARSON, Chairman, Long Island
Lighting Company, New York, N. Y.
Gas Production Committee

K. B. NAGLER, Chairman, The Peoples
Gas Light & Coke Co., Chicago, Ill.

THURSDAY AFTERNOON, OCTOBER 17

2:00 o'clock

Red Lacquer Room

Review of Developments in Heavy
Oil Tar and Emulsion Handling

P. T. DASHIELL, Vice-President, The
Philadelphia Gas Works Co., Phila-
delphia, Pa.

Developments in Gas Making Proc-
esses for Peak Loads

LEON J. WILLIEN, Byllesby Engineer-
ing & Management Corp., Chicago, Ill.

Measurement of the Expansion of
Coal During Carbonization

V. J. ALTIERI, Massachusetts Gas
Companies, Everett, Mass.

Open Forum

Natural Gas in Michigan

FOURTEEN gas wells were completed
in Michigan from July 25, 1935, when
the report to that date was issued by
the Utilities Information Bureau, to Au-
gust 31, 1935. The total of the original
estimated open flow of these fourteen
wells is 85,445,000 cubic feet per day.

During the first six months of 1935
natural gas for distribution to customers
by public utilities was taken from wells
in four townships with an output for
these six months of 1,279,526,000 cubic
feet.

Natural gas is now distributed by the
Consumers Power Company to the Sagi-
naw and Bay City districts, by the Big
Rapids Gas Company to Big Rapids, by
the Gas Corporation of Michigan to Mt.
Pleasant, Rosebush and Clare, and by
Muskegon Gas Company to Muskegon
and Muskegon Heights.

The Utilities Information Bureau of
Michigan states that it "makes no pre-
dictions for the future, letting the reader
of this report draw his own conclusions.
However, we make the following esti-
mates: Natural gas is now being dis-
tributed at the rate of $2\frac{1}{2}$ billion cubic
feet per year and this amount will greatly
increase within the next year. Existing
reserves in proved fields if realized will
maintain this supply for a period not
greater than 7 to 9 years. If all the cities

in Central Michigan were to be served,
an additional 8 to 10 billion cubic feet
per year would be required which would
bring the total amount to 11 to 15 bil-
lion cubic feet per year. The United
States Bureau of Mines Report gives 89
billion cubic feet as the most gas that
can be hoped for from present reserves,
extensions of present fields and from new
fields to be developed in Central Michi-
gan, which would last at the rate of 11
to 15 billion cubic feet per year for 6 to
8 years."

New York Company Goes
on Air

THE initial broadcast of a radio pro-
gram sponsored by the Consolidated
Gas Company of New York and its affili-
ated companies took place over Station
WEAF, Sunday evening, September 29,
from 6:30 to 7:30 o'clock. The program,
which recreates historical highlights of
New York City in music and story, will
be a continuing feature every Sunday
evening.

An imposing array of talent has been
secured for the company's program. Head-
liners will include Rosemarie Brancato,
coloratura soprano of the Chicago Opera
Company; Helen Claire, dramatic star;
Jan Pearce, male soloist; Josef Benime,
orchestra conductor; and many others.

Markets for Gas—Old and New

THE business in which we are engaged has some features that make it rather unique among the larger industries of the country.

Our industry is, to a degree, a monopoly, yet it is highly competitive. It is standardized, yet it is always being imbued with new practices. It is considered a fully grown industry, yet it is entering a period of rapid growth. It has many technical developments to its credit, yet many important new ones loom up in the future. Its service keeps the tiny cigar lighter going in the corner store, yet that same service is depended upon to supply the heaviest demands of great industries. One of the most novel features of our business is that our product is only used in an indirect manner, that is through appliances. It has very little value in itself. Immediately upon the purchase and delivery of an appliance it is connected to the gas company's property and the company assumes the task of permanently supplying it with life giving energy, without which it is of no use to its owner whatsoever.

Maintaining Customer Acceptance

The extent to which our service is used depends upon no single factor. Price and salesmanship are always of immediate importance in securing business. But, despite expert salesmanship and favorable price, to secure business and to hold business, the combination of gas apparatus and gas heat must be suitable to the customer's requirements and suit his desires. If that suitability of equipment and service is not definitely offered, we cannot secure business. If it is not rigorously maintained, we cannot hold business.

Suitability is not a static thing. In hundreds of industrial and commercial heating processes there are any number of different ways of applying heat. These manufacturing processes and the most suitable methods of applying heat to them are constantly changing. Also in the home, the housewife now

By **EUGENE D. MILENER**

American Gas Association

has, to cite only one instance, the choice of brewing coffee in at least four different ways. Our industry recognizes the fact that this extreme diversity exists, and faces it in a progressive manner by continually conducting research and development to the end that gas equipment and gas service shall be suitable for the tasks they have to perform.

Methods of Research

Research and development in the industry cover a very broad field. The continuing results are contributed to by many equipment companies, gas companies and individuals. The American Gas Association directly sponsors many important research projects, and in addition acts as the instigator and clearing house of ideas, and as a clearing house of the results of research and developments throughout the industry. The cooperation extended by the industry and by interested groups outside the industry is gratefully appreciated. Without such cooperation no worth-while results can be attained.

In the industrial field utilization research must be approached with two things always in mind. A given factory operation that requires heat can be approached in one of two ways. First it can be viewed in the light of keeping the fundamental process the same and lowering the unit fuel consumption. It is generally advisable to do this, if possible. Many times it is absolutely necessary to find ways of reducing unit costs in order to keep gas in the picture in a particular industry.

The second approach is to apply or develop one or more distinctly different processes for carrying on the manufacturing operation; processes that fit better into the characteristics of gas heat. It is the second method where the greatest inertia must be overcome. It is the second method that requires real research. Both methods, however, involve engineering and development.

The American Gas Association in its industrial gas research has resorted

to both methods. As an example of the first, core baking in foundries might be mentioned. Intensive laboratory studies were made to determine the minimum amount of energy in the form of convected heat required for baking cores. With this basic information, which was placed in the hands of core oven manufacturers, we were in a position to urge that their gas ovens be improved so that the newly found unit heat requirements would be more generally approached in practice. Core oven manufacturers found this basic information extremely useful and largely as a result of the manufacturers' efforts in applying this information, convected gas heat core ovens became more firmly established and the very threatening competition of radiant heat electric core ovens was largely blocked. Technical bulletins published by the Association have been distributed to foundrymen, with the help of the American Foundrymen's Association, and papers presented at their meetings helped prepare the way for the improved gas ovens and at the same time block the inroads that were being made by electricity and the other fuels.

Changing the Process

The other type of industrial gas project involves changing the process which, of course, also involves designing entirely new apparatus based on the new method of applying heat. An interesting example is stereotype melting in newspaper and other publication plants. A few years ago, I suppose there was no class of industrial business that gas men considered more firmly established than stereotype melting. True, electricity and oil had broken in here and there, but gas men as a rule explained that away by pointing in each case to some unusual local condition. But then came the high speed metal caster! This was an invention of the newspaper machinery trade and it more than doubled the hourly metal requirements. And with these heavy requirements for metal came a failure of many gas installations to keep up with the production. Electric men were not slow in getting the word

around that electric heating elements were the way out for publishers. Even while a natural gas line was being run to one of the largest cities in the country the gas company lost to electricity practically every important stereotype job in the town.

The Research Committee met this situation by conducting tests to determine the new metal requirements, and then completely discarding the older ways of heating pots, which ways were really a heritage from coal burning days. There was next designed and built a type of immersion gas heating equipment that duplicated the performance of electric elements, but at a lower cost. Field tests were conducted in a prominent newspaper plant, improvements were made step by step and finally the manufacturer of the high speed casters was persuaded to accept fully the results and recommend the new apparatus. Today electricity has practically ceased to be a competitor and this method of heating with gas is being rapidly adopted by newspapers from the very largest chain of big city dailies down to small town weeklies. It was not operating costs that threatened to lose the stereotype load. It was the old type of equipment ceasing to be suitable.

Notable Contributions

In the field of pure research, the gas industry has made some notable contributions in metallurgical heating. To a lesser degree this is true in several branches of ceramics, bread baking and other fields. These are covered by appropriate scientific bulletins. Also scientific projects designed to build up a thorough technical knowledge of high temperature gas combustion have been under way for several years. These latter of course do not apply to any single application of gas, but are of importance in raising the general level of industrial gas utilization. There have been published from time to time three editions of the handbook entitled "Combustion." However, fairly definite limitations are reached when each revision is made because many angles of high temperature combustion have never been fully run down, and because most of the technical treatises on the general subject of combustion have no direct bearing on burning

Bringing Comfort to Washington Employees



Lighting the gas flame that operates the Silica Gel summer air conditioning system recently installed in the Washington Gas Light Company building in Washington, D. C., one of the largest installations to date. Officiating are Sidney Taliaferro, former district commissioner, Corcoran Thom and M. L. Sperry, president of the company

public utility gas as it is generally applied. We are, therefore, in this series of fundamental researches attempting to uncover every dead end and thoroughly explore it so that the industry will eventually have available as complete references on this subject as there are available on many basic chemical and electrical subjects. Up to this time seven research bulletins resulting from this work have been published and widely distributed throughout utility and technical circles.

On the practical side of combustion research there has been the development of diffusion flame combustion. This is now being extensively used in an increasing number of large factory applications, and work is under way to make it suitable for small high-temperature operations.

One of the methods employed by the Association in its industrial research work is to study manufacturing trends and attempt to determine those that might have a bearing on how heat will be used in the future. It was early realized that in some industries there

was developing a feeling of unrest with results that could be attained when heating products in direct fired furnaces or direct fired ovens, where the products of combustion come into actual contact with articles or material being heated. We gas men have always been jealous of the thought that direct firing was a tool that we could use in overcoming the limitations of other fuels. Direct firing is one of our best tools, and will continue to be so, but certain things are happening that are putting limitations on our ability to use it under all conditions. Among these things is the trend toward the use of prepared or synthetic atmospheres for surrounding the work and which entirely excludes the heating gases from the furnace chamber. Sensing this trend several years ago and realizing the increasing effect it was bound to have on one factory heating process after another, our research committee began preparing for it. First with forging, the gas blanket for use with the diffusion flame method of heating was developed. This effectively

seals off the heating gases from the work without having a separate chamber, and prevents scaling and other undesirable metallurgical changes from taking place. The gas blanket is limited however, to certain heating operations, particularly the cruder ones, but fortunately the very high temperature operations can be handled in this manner.

Research and development work were then concentrated on the lower temperature operations and methods were devised for preparing synthetic furnace atmospheres with city gas as well as other gases, and apparatus has been developed for conducting many of the refined heating operations in this manner. Gas-fired bright annealing apparatus with prepared atmospheres is now being installed in increasing quantities as is also gas carburizing, nitriding, hardening, drawing, and other types of equipment, all using synthetic furnace atmospheres.

Gas Hot Tubes

For interpreting these prepared atmosphere heating processes the equipment consists not only of highly developed furnaces of the mechanical type using metallic muffles but more recently gas hot tube, or radiant tube, furnaces of both batch and continuous type that equal in design any furnace equipment ever installed in American factories. In my opinion, gas hot tubes are the nearest thing yet devised that are a direct answer to electric heating elements for furnace heating.

The automobile industry has been the battle ground for introducing most of the developments in prepared atmosphere furnaces both in steel mills for making high grade sheets for bodies and for actual car manufacture itself. It is indeed fortunate from that angle alone, that it has been possible to devise superior gas heated apparatus, particularly that heated with the new gas hot tubes, that meet the full requirements of heating furnaces that use synthetic and prepared atmospheres, because in no other industry that I know of had electric heat been so enthusiastically received, and become so intensively applied. It is pleasant to note that gas companies serving the large automotive centers are now every month increasing the amount of load that is replacing electricity.

One of the fastest growing public utility loads at the present time is air conditioning. That portion devoted to comfort in winter has been a gradual and natural evolution of house heating. The summer portion is comparatively new. The industrial portion is also somewhat new and is closely tied up during both summer and winter with manufacturing processes.

Air Conditioning Status

The question often asked is where does the gas industry stand in air conditioning? It is with some hesitancy that I assume to predict for the benefit of so many people who live in this delightful climate, the future course of man-made weather. However, with the limitations of a background of always having lived in places that are either too cold or too hot, or too damp or too dry, I venture the statement that with winter air conditioning we are as an industry a leader in the field. We not only have an almost perfect medium for interpreting winter air conditioning, but our manufacturers have developed equipment that is suitable for complete winter air conditioning of most types of structures.

In fact this industry was the pioneer in winter air conditioning. Last winter in discussing the subject with a group of prominent air conditioning

engineers I remarked that the first complete winter air conditioning apparatus offered to the public, that is one which heated, circulated, cleaned and humidified the air was a piece of gas apparatus; and, furthermore, I pointed out that it was built and sold nearly 18 years ago by one of my good gas friends of the Pacific Coast—E. L. Payne. I was pleased when the statement was not challenged. A lot of water has gone over the dam in those 18 years, but the time has been well spent in making gas winter air conditioning equipment more reliable and more satisfactory and has resulted in a general acceptance of gas as first choice for winter air conditioning for many classes of buildings.

Completing the Cycle

The next job was to complete the year 'round cycle by extending gas to summer air conditioning. I suggest that for next year every gas company should set that goal for itself—year 'round air conditioning with gas. There are six or seven ways in which this can be done. I will mention only three, because they are enough to illustrate my point. First, and probably the most logical in some territories, is to substitute gas engine power for electric power for driving compression refrigeration equipment, and handle the whole job in that manner. That, of course, has been done in isolated instances, but, in most cases, they have been locally engineered jobs. The necessity for too much local engineering on each job handicaps sales, increases costs and prevents a rapid acceptance by the public. Air conditioning jobs where engines have replaced motors have met with a degree of success that is comparable with the success attained when similar efforts are made to replace motors with gas engines for general power purposes. This method of summer air conditioning with gas, I think you will agree with me, can only reach its full possibilities both technically and from a sales standpoint when gas engines and refrigeration equipment are engineered together and sold as single compact units having all the automatic starting and control features and ease of installation of complete electric units. Fortunately,

(Continued on page 381)

Goodbye Mr. Ashcan



Cartoon from "To Serve New York" publication of the Consolidated Gas Company of New York which appeared shortly after new house heating rates went into effect

Gas Sales as Affected by Temperature

PART 1—Graphic Method of Adjustments and Typical Application to Study of Sales Trends

By H. P. SMITH and
S. J. HELFMAN

Rate Department, Equitable Gas
Company, Pittsburgh, Pa.

THE changes which are continually taking place in the residential gas market make essential a close scrutiny of the sales to this class of consumers. Executive commercial planning in this field is more firmly grounded if the statistics of residential consumption are carefully analysed each month to ascertain the trend of use per customer by comparison with preceding months and preceding years. This trend is not apparent, however, if the comparison is made directly from the unadjusted statistics contained in the accounting reports of residential sales. It is first necessary to reduce all monthly figures of M cu.ft. sales per consumer to a uniform and equivalent basis by adjusting for the following two important factors:

- (1) The effect of varying atmospheric temperatures upon the quantity of gas consumed, and
- (2) The variation in time or period covered by the reported monthly statistics due to the prevailing policy of "rotating" the meter-reading schedule—by virtue of which the total of meters to be read is distributed throughout the month.

Importance of the Problem

These two factors inevitably result in reported monthly sales statistics which are not directly correlated to either the number of days in the calendar month for which the accountants nominally render the report, or to the mean atmospheric temperature for that calendar month. Instead, the reported monthly sales are found to depend upon the composite of the individual billing periods (i.e., meter-reading periods) of the thousands of individual consumers whose meters are read within the report month, and also upon the composite effect of the daily atmospheric temperatures during the entire range of time covered by all these individual billing periods.

It is the function of this article to present to the industry a convenient

and simple method of calculating the effect of these two factors: the composite time—factor (hereafter referred to as the "weighted average billing period") and the composite temperature (referred to as the "weighted average temperature"). The variation of the weighted average billing period from month to month and year to year is shown for one typical territory, in Table 1. This is the territory served by the Equitable Gas Company, consisting principally of Pittsburgh and its environs. A study of Table 1 shows that the weighted average billing period may differ from the number of days in the calendar month of the accounting report by as much as $1\frac{1}{2}$ days, or 5%. Even the same month in different years may show a difference between weighted average billing periods of over 1 day—in other words over 3%.

Similarly—and of still greater importance in the effect upon magnitude of sales—the discrepancies between the weighted average temperatures (to which the reported monthly sales should be related) and the mean temperatures of the calendar months for which the sales are nominally reported,

may be illustrated by reference to Table 2—also applying to the Pittsburgh territory. Although this table has been extended through only three years, it is sufficient to demonstrate the point. The table shows that the differences between the two types of temperatures were frequently over 5° F., and in two months, namely: March 1929 and October 1930, they were 9.5° and 9.2° respectively. Inasmuch as a variation of one degree in the mean monthly temperature during the heating season produces a variation in monthly sales of roughly $1\frac{1}{2}$ to 2%, the magnitude of these temperature discrepancies in relation to the statistics of sales is seen to be very considerable.

Relationship Between Factors

The above illustrations, from Tables 1 and 2, show the importance of relating the reported monthly sales to the weighted average billing period and to the corresponding weighted average temperature rather than to the length and temperature of the calendar month in which the meters are read. Once the proper relationship is established, it becomes possible each month to adjust the reported monthly sales to a uniform billing period (30 days, for example) and to the normal temperature for the billing period, so that a comparison between correspond-

TABLE 1
Weighted Average Billing Periods Applicable to Reported Monthly Residential Sales of the Equitable Gas Company

MONTH	1927	1928	1929	1930	1931	1932	1933 (Note A)	1934
January	31.87	31.91	31.86	31.81	32.39	31.82	31.91	32.02
February	28.23	28.87	28.85	28.87	28.84	28.89	28.24	29.00
March	30.10	30.60	29.46	29.48	29.54	30.64	30.07	29.73
April	30.88	30.38	30.38	30.35	30.31	30.88	30.33	30.19
May	29.83	29.78	30.35	30.34	29.74	29.83	29.83	30.12
June	30.86	31.43	30.86	30.91	30.95	30.86	31.42	31.40
July	30.78	30.87	30.83	30.78	31.35	30.78	30.83	30.76
August	30.50	30.39	30.99	30.43	30.46	30.50	30.45	30.83
September	31.30	30.85	30.95	30.95	30.68	31.30	31.35	30.81
October	29.92	29.86	29.76	30.32	30.54	29.92	29.91	29.49
November	30.00	30.34	30.39	29.85	29.95	30.00	29.73	30.78
December	30.85	30.52	30.52	30.50	30.41	30.85	30.52	30.37
TOTAL	365.12	365.80	365.20	364.59	365.16	366.27	364.59	365.50

NOTE A—Prior to November 11, 1933, meters were read daily except Sundays and legal holidays, but beginning with that date readings were discontinued on Saturdays.

ing months of different years will be on a uniform and equivalent basis.

Considering now only the weighted average temperatures by themselves, the deviation from normal caused by extreme climatic fluctuations may be very considerable. For example, in the Pittsburgh territory, the weighted average temperature applicable to the reported sales for January 1932 was 42.1°, while the corresponding normal temperature is 32.0°—a difference of

10.1°. This excess over the normal temperature is estimated to have curtailed the sales by 20.1% below the quantity which would have been sold (and reported) if the temperature had been normal. This is an extreme case, it is true, but required adjustments of 10%, and over, are by no means uncommon under the climatic conditions prevailing; and required adjustments of 5 to 10% are frequent.

The method of determining the

amount of the adjustment required between actual and normal temperature, and also the method of adjusting for billing period, are explained in the following section, which assumes that the weighted average temperatures and weighted average billing periods have already been calculated. The method of calculating these factors, and the basic principles involved are discussed in the second part of this article which will appear in a later issue. There will also be described the actual statistical procedure which is recommended in order to expedite these calculations on a simple monthly routine basis.

TABLE 2

Comparison of Monthly Mean Atmospheric Temperatures (° F.) for (1) Calendar Months, and (2) Composite Months Contained in the Reported Residential Gas Sales of the Equitable Gas Company

	1929		1930		1931		Normal (Period 1875-1921, Incl.)	
	Calendar	Composite	Calendar	Composite	Calendar	Composite	Calendar	Composite
January	28.0	31.8	31.8	36.2	33.2	31.1	30.5	32.0
February	28.6	26.9	39.0	30.5	34.6	34.1	32.3	31.0
March	46.4	36.9	37.8	39.7	36.4	34.6	39.6	35.6
April	53.4	52.3	51.5	44.3	50.6	44.6	51.2	45.2
May	59.5	54.1	63.0	59.7	60.8	54.5	62.3	57.0
June	68.7	64.6	69.9	63.9	70.0	64.6	70.7	66.8
July	73.0	72.2	75.0	72.0	77.0	75.2	74.7	73.2
August	68.2	71.5	71.6	75.3	73.0	76.2	72.8	74.2
September	67.1	68.6	69.8	71.0	70.3	70.9	66.4	70.0
October	52.2	58.1	52.4	61.6	57.4	64.2	55.6	61.3
November	41.0	49.4	43.9	47.1	51.6	53.0	43.2	49.4
December	34.6	34.9	31.5	37.7	41.5	46.2	34.2	38.2

Typical Application of Method of Adjusting for Weighted Average Temperatures and Billing Periods

The Equitable Gas Company has for several years used this method of calculating the weighted average temperature and weighted average billing period. This application has been found invaluable not only in the analysis of past statistics but also in develop-

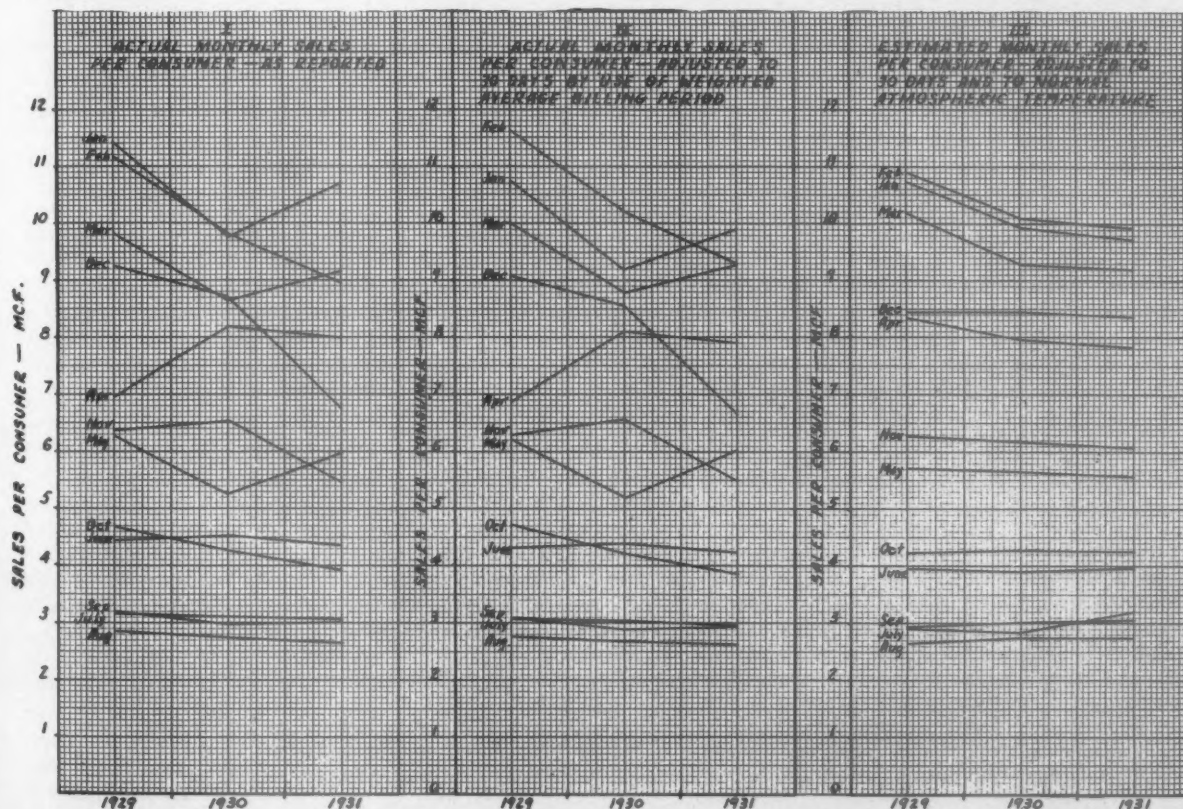


Chart 1—Progressive effect upon reported monthly sales per consumer of adjusting for weighted average billing period and for normal atmospheric temperature

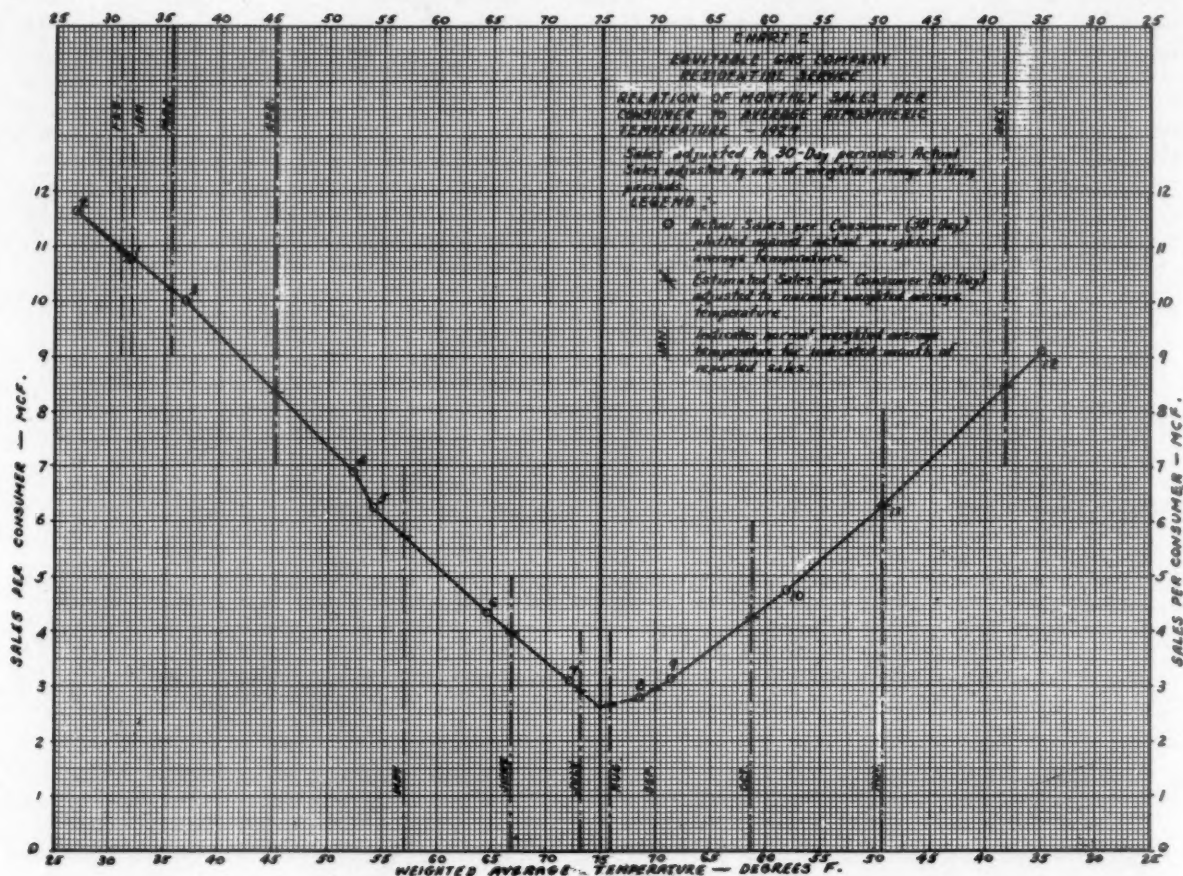


Chart 2

ing the base from which to prepare budget forecasts of future sales. In making such residential forecasts of sales and revenue, conditions of normal temperature were, of course, assumed; and insofar as future weighted average billing periods are concerned, these may be calculated as far in advance as desired, provided only that the general character of the meter-reading schedule is known.

Charts 1, 2, and 3, here presented, together illustrate a typical application of the method of adjustments and the quality of results obtained. Chart 1 shows the trend of average monthly sales per consumer in three different stages of the adjustment:

- I. The actual monthly sales per consumer, as calculated directly from the accounting reports of monthly sales (in M cu.ft.) and month-end consumers;
- II. the same ratios after adjusting for the time-factor by dividing

each figure of monthly sales per consumer by the corresponding weighted average billing period and then multiplying by 30 days—in other words, after adjusting to a 30-day basis; and

- III. the 30-day monthly sales per consumer, after adjusting to normal atmospheric temperatures.

The difference between I, the trend of actual monthly sales as reported, and III, the finally adjusted trend for 30-day periods and normal temperatures, is striking. The trend of actual monthly sales, as reported, is very confusing, the trend of certain months in 1930 apparently being violently up while other months are violently down, and with radical reversals in 1931. On the other hand, the finally adjusted trend shows a general uniformity between the various months and a tendency toward parallelism in seasonal groups of months. Thus, it can be stated that the adjusted trend of

use in the winter months was fairly sharply down from 1929 to 1930 but nearly leveling off in 1931; the trend of use in the spring and fall months was only slightly downward from 1929 to 1930 with practically a continuation of the same gradual trend in 1931; while the trend in the summer months was slightly upward throughout, generally speaking. It is impossible to draw any such valid conclusions from the statistics of actual monthly sales per consumer, as reported, and shown in I.

In following through Chart 1, from part I to II, and II to III, it is obvious that the change in trends in going from II to III is far greater than the change from I to II. In other words, the effect of adjusting for temperature is far greater than the effect of adjusting for billing period, as stated elsewhere above. Nevertheless, the adjustment for billing period cannot be neglected or omitted, for it will be

shown that the use of the weighted average billing period is integral with the adjustment to normal temperature, and the calculation of the weighted average billing period is coincident with the more extensive calculation of the weighted average temperature.

The transition from part II to III in Chart 1, or the adjustment of the 30-day sales per consumer from actual temperature to normal temperature, is made by means of a chart similar to Chart 2. The latter has been expressly limited to one year's data only—namely, for 1929—in order to simplify the demonstration from a graphical standpoint. Briefly, Chart 2 shows the relation of the actual monthly sales per consumer (adjusted to 30-day periods) to the actual weighted average temperatures, with interpolated or extrapolated values of sales per consumer at the indicated normal temperatures. Each point marked by a circle indicates the actual 30-day sales per consumer as the ordinate, plotted against the corresponding weighted average temperature as the abscissa. (These values of sales per consumer are the same as in section II of Chart 1.) Successive circles are connected by straight lines, going progressively from January to July, and from August to December—both the year and the chart being divided into two parts on that basis in order to form what is roughly equivalent to a "V curve." The left part of the chart is based upon a range of weighted average temperatures increasing from 25° F. to 75° F.; while the right part covers a descending temperature range from 75° down to 25°.

Relation Between Sales and Temperature

As a valid general conclusion, the chart presents a relation between monthly sales and atmospheric temperature which is roughly the following: As the temperature increases, the average gas sales per consumer decreases; and, conversely, as the temperature decreases, the average gas sales per consumer increases. In both cases the law of variation is roughly linear during the greater part of the year in which gas is burned for space heating. This linear character could be demonstrated by drawing, in each half of the chart, a straight line which

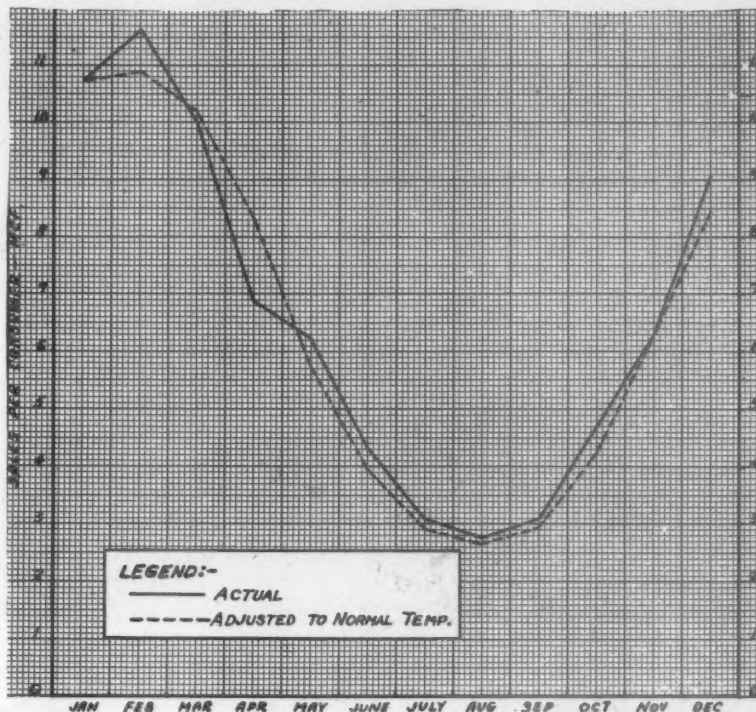


Chart 3—Comparison between actual monthly sales per consumer and values adjusted to normal atmospheric temperatures—1929. All sales adjusted to 30-day periods. Actual sales adjusted by use of weighted average billing periods. Normal sales for 30 days obtained directly from Chart 1

would fit the points fairly well, and without unreasonable deviation of the points from the line. However, for the type of adjustments required in this study, it has been found more accurate to connect the successive points by straight lines.

The linear relation of gas sales to atmospheric temperature is not a rigid scientific law like "Boyle's Law" expressing the relation between volume of gas and the pressure and temperature. It is simply a general statement of consumer habits and the psychology of the use of gas as affected by the principal one of the climatic factors—namely, atmospheric temperature. Because other climatic factors such as rain, snow, wind, and cloudiness are omitted, and also because the total gas use represents the composite habits of use of thousands of individual consumers, the relation of sales to temperature cannot be exactly linear, but can only approach a linear character. If all gas heating installations were equipped with automatic temperature control, the approach to a linear relation would be still closer.

Referring again to the chart, permanent vertical lines are shown representing the twelve normal monthly temperatures. These are the normal temperatures, not for the calendar months, but for composite periods based upon a rotating meter reading schedule; and they represent the normal conditions for each of the twelve monthly sales reports. (The method of calculating these normal temperatures is similar to that of calculating the monthly weighted average temperatures, and will also be described in the second part of this article.) Each of these vertical normal-temperature lines intersects the V-curve, and the ordinate-value at the intersection (indicated on the chart by a horizontal mark) is the estimated 30-day sales per consumer at normal temperature. These values are then transferred to section III of the first chart, thus completing the transition from II to III. All of these estimated "normal" sales values in 1929, with the exception of July and August, are interpolations on Chart 2, these two are extrapolations,

(Continued on page 383)



Gas-fired crucible type furnaces in which gold is melted at the U. S. mint, Philadelphia

RECENTLY two billion dollars in gold were moved from the mint in San Francisco to Denver, the most colossal treasure transfer in history. It was accomplished with the help of the U. S. Post Office with an elaborate system of protection against loss, by theft or otherwise. The gold was in the form of bars each valued at \$37,500 and was moved at night through the streets of San Francisco in armored cars to the railroads. Squads of police and army trucks loaded with armed troops and aided by flood lights guarded the million dollar loads. A ton of gold to each mail truck and 8 trucks to a convoy, eight million dollars, nearly 60,000 bars in all.

This was the sum total of the gold piled up by the San Francisco Mint in 80 years. It is still receiving gold and is working overtime stamping silver coins. Each of eight machines here is turning out 50,000 silver coins daily. In Philadelphia the mint is operating twenty machines on silver. The present demand for silver coins is large.

The first mint for making metal coins was established by the government in 1792 at Philadelphia and later four others were built at Denver, San Francisco, New Orleans and Carson City but the last two are now used as assay offices only. A large portion of

the wealth of the nation, in the form of gold and silver, is housed in the U. S. Mint at Philadelphia. Here these metals are purchased, melted in gas furnaces and cast into bars, rolled into strips, blank discs punched out and these are coined, between dies in mechanical presses, into the dollars and dimes of commerce. This method was adopted in Great Britain in about 1572.

Coinage Record

Recently this mint set an all time coinage record for government mints by producing \$3,506,547 in copper coins. Included were 242,503,500 copper cents.

The U. S. Mints purchase all the gold offered to them, formerly at \$20.67 per ounce, now at around \$35. Silver is bought when needed as is copper, nickel, zinc and bronze, this latter for medals. Gold and silver coins have contained many alloying metals, down through the centuries, but mostly copper and in varying amounts.

The gold standard of 22 carats is applied to the alloy gold and copper, 916.6 parts gold and 35.4 parts copper. This standard was adopted in England as far back as 1526. Sterling, a widely known silver standard of British origin, introduced by the Saxons, consists of 925 parts of silver and 75

Metal Into Money

By J. B. NEALEY

American Gas Association

parts of copper. This was later debased and then restored by Queen Elizabeth only to be debased again in 1920, to half silver and half copper.

Gold coins made in the U. S. mints contain 900 parts of gold and 100 parts copper while those of silver are 900 silver and 100 copper. Nickel coins are made from an alloy containing 75% copper and 25% nickel. As gold and silver are purchased in pigs or cakes of various sizes they are first melted down and recast into ingots of uniform size. The melting is accomplished in crucibles in gas-fired furnaces. The furnaces are built of refractory material, cylindrical in shape and covered with sheet steel. A single gas burner fires into the furnace in such a way that the flames envelop the crucible containing the metal. All fumes are exhausted through a stack.

As soon as the metal is reduced to the molten state the crucibles are removed and transferred to the pouring tables. These are circular steel plates, 6 ft. in diameter, turning on ball bearings and holding a series of steel molds. The metal is poured into these molds and as soon as the ingots have been cooled they are transferred to the rolling mills. There are 12 of these



Motor-driven counting machine

melting furnaces on the ground floor and 9 in the second floor. The gold and silver ingots are $2\frac{3}{8}$ in. wide, $\frac{1}{2}$ in. thick and a foot long.

These ingots are reduced to strip form in rolling mills, the final thickness of the strips corresponding to the thickness of the coins to be made from them. It takes several passes through the rolls of the mills which are known respectively as breakdown, thinning and finishing or guagings. For instance a silver bar passes through the breakdown rolls 17 times, the rolls being set closer together after each pass. This so hardens the metal that the blanks are annealed to prevent the coin presses from being broken by the impact against them.

The strips are next put through blanking presses, power driven, which cut blanks to the exact sizes of the various coins. These presses are equipped with automatic feeders which advance the strip after each blow of the punch. The coin blanks drop through a chute to a container. If you look at a coin you will note that the outer edge has a slightly thicker rim to protect it from wear. This is put on, at this point, in upsetting machines.

Gas Furnaces Soften Metal

All the blanks, whether gold, silver, nickel, or copper, are softened in gas-fired furnaces of the rotary retort type. Each retort (horizontal), which is enclosed by a steel shell, is heated with 16 gas burners, divided in two groups firing against opposite sides. Another gas burner fires directly into the retort to provide the correct atmosphere. The temperature range is 1300-1400 deg. F. and the metal is heated for from 15 to 20 minutes. The annealed blanks are discharged into a tank of water, brightened or blanchd in an acid bath and then polished in tumbling barrels. They are handled in perforated copper buckets by means of hoist and swing post cranes.

Coining is now done by stamping the blanks in presses between engraved dies and surrounded by a collar which mills the outside edge at the same time. These presses operate continuously as the blanks are fed by a hopper. This keeps a nicely piled stack of blanks adjacent to the die and at every stroke of the press the bottom



Gas-fired rotary retort furnaces in which coin blanks are annealed

blank is pushed mechanically into the die. Some of them operate at the rate of 100 coins a minute. Each is equipped with a counter which automatically counts the coins as made.

This practice varies only with the silver dollar and twenty dollar gold pieces (double eagle) as the blanks are fed into these presses by hand. For these two pieces 150-ton presses are used while the half dollars are stamped in 50- and 60-ton presses, nickels in 50-ton presses and pennies in 38-ton presses. As stated, hardened steel dies are engraved so that the designs are embossed on the two faces of the blank.

The mint is equipped with long lines of these machines, rolling mills, blanking presses, upsetters, and coining presses and all are power-driven. The finished coins are individually inspected on long tables provided with traveling belts with a mechanical "flipper" in the center which automatically turns the coins so that both sides are on view alternately. The inspection is done by highly trained women. Each coin is then weighed in delicate, automatic weighing machines. Dollars, half dollars, quarters, eagles, half eagles and quarter eagles are weighed, ten coins a minute in each of ten beams to a scale. This is at the rate of 100 coins per minute per ma-

chine. The coins are stacked in holders and a motor driven piston pushes a coin from the bottom of the pile at timed intervals onto the weighing beam where it rests momentarily and is then automatically tripped off into a container.

The number of coins are then checked in mechanical counting machines and bagged. A rotating circular plate throws the coins, by centrifugal force and they pass one at a time, through the slot of the counter which registers its passage. These will count the smaller coins at the rate of 2000 per minute.

Modernization is the byword in the various mints as witnessed by a recent report of the director of the mint who says of the Denver Mint: "The new type of melting furnaces installed, using natural gas, insulation against radiation of heat, and preheating of air from waste heat, has resulted in economy in the use of fuel in the increased production of ingots. The melting time has been reduced and the service life of furnace linings has been increased."

Nickel was employed as far back as 235 B. C. but in a small way. Today 24 countries have issued 3,000,000,000 pure nickel coins, while more than 70 countries are using coins of nickel and copper.

Fire Prevention Week and Its Objectives

By N. E. BERTL

A. G. A. Representative to the National Fire Protection Association

THE observance of Fire Prevention Week, October 6-12, 1935, is a humanitarian and economic movement sponsored by the National Fire Protection Association and proclaimed by the President of the United States to conserve human life and property from the ravages of fire. In the year 1934 approximately 10,000 people were burned to death and many more thousands were injured. It is surprising to note that two thirds of the entire 10,000 who were burned to death in the last twelve months lost their lives in residences or apartments. Property loss from fire during 1934 is estimated at \$262,848,122. Ten years ago this figure was up to \$549,062,124. A great part of this reduction in fire loss can be attributed to the Fire Prevention movement sponsored by the National Fire Protection Association and the cooperative response of other organizations as well as model building codes enforced by municipalities.

Needless Loss

Most fires originated through carelessness and non-compliance with regulations and codes recommended by fire prevention authorities and local municipal ordinances. It is not the purpose in fire prevention campaigns to disseminate fear into the public minds, but to make them conscious of the needless loss of human lives and property loss claimed by fire. By bringing these facts to the public and spreading the good gospel on *how to prevent these enormous and needless losses by fire* is the message which fire prevention campaigns impart to the public.

The American Gas Association and its membership have both a humanitarian and selfish interest in this movement on fire prevention. The preservation of human life is a major factor in the welfare of a nation and its economic success. Looking at this picture from the economic side, fire waste claims property losses to the

home and industry. Our member utilities are directly affected by these fire losses. When homes burn down the company serving a consumer loses an account until rehabilitation takes place. In industry besides impairing the personal account of the factory which has burned down, people working for this concern find themselves without employment for a time. Unemployment naturally affects our industry.

A. G. A. Cooperation

Fire in its controlled state is a useful and essential servant of man but uncontrolled it becomes a menace. Our Association through its Testing Laboratory is continually aiding fire prevention by regulating gas equipment standards and aiding equipment manufacturers to offer to the public safe means of using controlled fire or heat producing commodity. We recognize and recommend the installation of equipment and use of our commodity in accordance with the recommendation of fire prevention authorities such as the National Fire Protection Association and the various municipal authorities.

All these cooperative functions on fire prevention by our Association have reflected themselves in actual statistics which are on the records of the Actuarial Bureau of the National Board of Fire Underwriters. Over a ten-year period the fire loss due to manufactured and natural gas produced and sold in the United States has declined from \$3.25 per million cubic feet to \$1.00 per million cubic feet. We are proud of this accomplishment, but no accomplishment is worthy unless it can be improved upon; therefore we have an objective in view.

The American Gas Association and its members have a definite obligation to the public they serve as well as a

selfish gain to further their efforts on fire prevention. Besides the work that is already in progress in aiding fire prevention let us look back on the statistics that two thirds of the lives lost by fire originated in the home. This proves that the gospel of fire prevention must be carried into the home. The gas industry through the universal use of its product in home and industry contacts practically every home through its service. This personal contact with the public and home gives a splendid opportunity to spread the gospel of fire prevention.

Many utilities are already using this means of aiding fire prevention, but your Association would like to see a 100% enrollment in this worthy cause.

There are numerous opportunities and means of disseminating fire prevention information by our member companies. First we have the National Fire Protection Association whose chairman, T. Alfred Fleming of the International Committee for Fire Prevention Week can be contacted for aid in planning Fire Prevention Week. Also the A. G. A. Representative to the National Fire Protection Association will be glad to offer his assistance to this cause.

Gas Company Aid

To augment fire prevention material available at nominal cost from the National Fire Protection Association and National Board of Fire Underwriters there are other inexpensive activities in which gas companies can take part:

Window displays may be arranged for the week calling the attention of the public to approved A. G. A.-tested appliances and making comparison with obsolete equipment or methods of installations which may be considered hazardous. This presents an excellent opportunity to capitalize on gas house heating, emphasizing its safety in comparison with other fuels where ashes and uncontrolled heat creates an inherent fire hazard. Where gas heat-

ing is used, basements are fitted up as recreation rooms and the practice of using them as store rooms and for accumulation of rubbish is eliminated. These displays in show rooms will also give an opportunity to point out the safety features in modern gas equipment and what the gas industry is contributing to the public for the use of a safe, efficient and clean fuel.

Safety rules for the home may be prepared on a small slip, to be included with gas bills and invitations given to inspect the safe and modern gas equipment available. Thus the campaign is carried into every home and there will be an incentive created to install safer and modern gas equipment.

Meter readers and service men who contact the public have an opportunity of noting conditions in basements and homes and bringing hazardous conditions to the attention of the home owner. This may also lead to having old equipment replaced by modern gas equipment and emphasizing the safety equipment incorporated with A. G. A. Laboratory-tested appliances.

Safe Practice Steps

It is also advantageous in this campaign to remind the public that the local gas company is interested in the safe use of their commodity and has service men available at their call to see that all gas equipment is safely and efficiently operated. The public should be discouraged against making their own connections of gas appliances by the so-called master mechanic of the household and seek the advice of the local gas company on all matters pertaining to piping, equipment and installation. They are in the best position to know through their contact with regulatory bodies what the safe practice requirements are and recommend the proper equipment and persons qualified to make the installation.

The Home Economic Departments of the various gas companies can also assist in this fire prevention campaign during their demonstration periods and emphasize the safety of the A. G. A. approval gas equipment available to the public. They can also bring to the attention of the house-

wife the fire hazards which may prevail in the home, especially the hazardous practice of using inflammable liquids such as gasoline as cleaners.

Most of the gas companies have safety departments with group leaders throughout the organization. During fire prevention week this group in its meetings can give special emphasis on fire hazards and how to eliminate them.

The participation of our Association and member companies in "Fire Prevention Week—October 6-12" will be a worthy movement as well as a gainful one. The outline and suggestions given here on this campaign to reduce fire waste are only elementary and many ingenious and productive plans can be formulated.

Red Cross Launches Drive To Prevent Home Accidents

By DOUGLAS GRIESEMER

Director, Public Information
The American Red Cross

THE average man thinks that when he reaches home he is quite safe. He congratulates himself on escaping sudden death by traffic and relaxes in an easy chair with the evening paper. He is safe at last in his castle, or so he thinks.

Unfortunately for him and particularly for his family he is in error. Whereas automobiles caused 36,000 deaths last year, accidents in the homes of America caused only 1,500 less and injured many thousands more!

The practical minded might be interested in the following: Home accidents run up a medical, nursing and insurance bill of more than \$1,000 per minute each day of each year. Industry has found that it cannot afford to be careless. Neither can the individuals of a household.

To cut the mounting toll of accidental injuries and deaths in the home, the American Red Cross has thrown the full weight of its entire organization behind a Home Accident Prevention program. The purpose of the campaign is to eliminate hazards from the homes of America and to awaken persons engaged in agriculture to the common hazards connected with farm work, since safety experts tell us agriculture has a higher accident death rate than any occupation or industry.

Through its nearly 15,000 chapters and branches, the Red Cross will be able to personally supervise an accident prevention campaign in practically every county in the United States. Red Cross chapters are cognizant of local opportunities and limitations and the campaign will be in effect the simultaneous launching of nearly 13,000

Each year at the National Fire Protection Association Convention a very complete report on "Fire Prevention and Clean-Up Campaign" is made by the chairman of the committee. In this report, direct mention is made of all organizations and their activity in this campaign and how it was conducted. To give our Association due credit for their efforts a complete report of each member company should be mailed to the American Gas Association which, in turn, will report for our industry to the International Committee for "Fire Prevention Week." These efforts will reflect directly on our industry and Association, and will substantiate the interest the industry has in the consumer it serves.

different programs which will, it is hoped, blanket the entire country.

A project of this nature is of necessity largely educational in character but the Red Cross plans also to solve the accident problem created by individual neglect and lack of knowledge by action. With the cooperation of educational groups and the children in our schools, actual inspection of homes will be made. The Red Cross home inspection form or check list will be taken into the home by the child who will then enlist the cooperation of parent or relative in the inspection itself. Statistics concerning accident hazard types peculiar to each community will be tabulated so that each Red Cross chapter may thereafter have a more exact knowledge of how to meet the home accident problem of a community.

Association To Help

National organizations and groups are being urged to help. Many have already pledged their aid. Among these is the American Gas Association. For ten years this association has maintained a testing laboratory for the purpose of checking appliances with particular regard to their safety.

A good way to start inspection in your own home is to ask yourself this question: "Are the gas appliances in my home approved by the American Gas Association Testing Laboratory?"

Member companies of the American Gas Association will be asked to cooperate closely with Red Cross chapters to insure local accident prevention.

The Red Cross is grateful to the National Safety Council for the generous help which this organization, long active in the accident prevention field, has given. In communities where home accident prevention has already been instigated by another

group the Red Cross chapter, to avoid duplication, will do all in its power to make the program of that organization a complete success.

Without individual aid, the Red Cross accident prevention campaign cannot be a

complete success. Why not inspect your home and do it now? Ask your local Red Cross chapter for some of its home inspection forms.

There is no time like the present to prevent future mishaps.

Gas Replaces Competitive Fuel for Pretzel Baking

By G. C. MARRS

Industrial Engineer, Consumers Gas Company, Reading, Pa.

ONCE again gas has proven itself to be the superior fuel, both as to economics and quality of product. This time it goes ahead in the pretzel baking industry.

The Quinlan Pretzel Company, located in Reading, Pa., and operating over all of the United States, is recognized as one of the leaders in the pretzel industry. Their engineers have recently developed and perfected a machine which has been the dream of pretzel manufacturers for years. It is a machine for the "twisting" of pretzels. These machines are now handling practically the entire output of this plant. "The pretzel with a distinctive twist" untouched by human hands.

In addition to the well-known pretzel this company also manufactures "Pretz-Sticks" which are made by a machine capable of making 60 strands at one time. These strands pass directly through the oven in an unbroken chain. This one oven has a capacity of approximately 1,000 feet of "Pretz-Sticks" per minute.

Gas-Fired Traveling Ovens

There are installed in this plant three traveling ovens; one 50 x 6 feet Baker Perkins traveling hearth oven, two 50 x 4 feet Universal traveling hearth ovens. For several years the Baker Perkins oven has been fired with gas, and the two Universal ovens were heated with a competitive fuel. The "cookers" for all three ovens were heated by gas, and the hot water requirements for the entire plant were supplied by means of a Bryant gas water heater.

A very careful survey of this plant indicated that a saving of approximately \$6,800 per year could be made by converting the two Universal ovens to gas. The cost of converting these ovens, including compressors and controls, was estimated at \$5,500, so it can readily be seen that the estimated savings should pay for the cost of converting in less than one year's operation.

On the basis of these figures, it was decided to go ahead with the conversion of the two ovens. The Universal Oven Company was given the contract for the complete conversion. The job of converting was quite simple, as it consisted only of removing the heating elements

from their respective boxes and inserting high pressure ribbon type burners in their place, and replacing the switches with motor-operated valves.

The first oven was converted and put into operation on April 15, 1935, and the second oven on May 7, 1935.

From the start these ovens have given entire satisfaction and the management is well pleased with the quality of product, which they state is superior to that previously obtained.

Fuel Cost Reduced 50%

Since the conversion of these ovens a careful check has been made to determine accurately what savings have been effected. It was very gratifying to find that now the total fuel cost per 100 lbs. of pretzels baked is approximately one-half the previous cost. This means a saving of approximately \$600 per month, which is slightly more than had been estimated.

To our company this means an additional annual consumption of 11,000,000 cu.ft., bringing this customer's total annual usage of gas up to approximately 26,000,000 cu.ft.

—U. G. I. Circle, September.

Richmond Housewives Hail Return of Gas

RESTORATION of gas service throughout Richmond, Virginia, was the most vital aftermath of the recent James River flood, as recession of the waters from a 26-foot crest to near normal brought joy to householders and caused hot meals to be appreciated.

Not so fortunate as numerous other communities this year who have received uninterrupted gas service in the face of severe flood conditions, Richmonders were confronted with a cessation of gas supply from 9 o'clock Saturday night, September 7, until Monday morning, when the municipal gas plant was flooded by rain-swollen waters from the James River.

A 24-hour supply—3,000,000 cubic feet in a storage tank—was exhausted in seven hours after a plea by Mayor Bright to consumers to use the reserve economically inspired housewives to rush to their kitchens and roast meats, bake breads and boil vegetables while they could. Nearly 32,000 households were affected along

with the commercial and industrial users of gas.

Even the daily newspaper, which had greeted the residents Sunday morning with that most unusual of all headlines, announcing a cessation of the gas supply, was affected. Huge stereotyping equipment, which molds metal plates from which the paper is printed, had to be converted temporarily from gas to other fuel. Part of the battery of typesetting machines ceased functioning when the gas that heated their metal went off. Others were fed during the emergency from artificial gas containers which were rushed to the plant.

Complete restoration of gas service became effective around 2 o'clock Monday afternoon, some 53 hours after it had been interrupted, and those housewives—and their husbands—who had been preparing meals with electric grills, canned heat, inverted flatirons and outdoor wood fires, sat down to dinner with a feeling of immense satisfaction. Hotels, restaurants and cafes likewise were able to serve patrons promptly.

Prominent Consulting Engineer Dies

WILLIAM HUTTON BLAUVELT, former general manager of the Semet-Solvay Company and prominent consulting engineer in New York, died September 13 in Pasadena, California. Mr. Blauvelt was a recognized authority in this country and abroad on the production of gas, recovery of by-products from soft coal and the general utilization of fuels.

Born March 20, 1863, at Elizabeth, N. J., Mr. Blauvelt was graduated from Lafayette College with degrees of E.M. and M.S. and took a post graduate course in chemistry. He joined the Semet-Solvay Company in 1895, shortly after the company had introduced the Mond Producer and the by-product coke oven in the United States and his activities centered largely around these new plants. He soon became a recognized authority in the by-product coke oven industry.

While with the Semet-Solvay organization Mr. Blauvelt served as consulting engineer, general manager of operations and later as manager of the new business department. During this period he was very active in the work of the various engineering societies and presented many papers at their annual meetings.

In 1922 Mr. Blauvelt left the Semet-Solvay Company and opened up consulting engineering offices in New York City. As a private consulting engineer his clientele included some of the largest gas companies in the city of Philadelphia.

In 1929 he gave up private engineering practice and joined the Columbia Gas & Electric Corporation as manager of their gas engineering department. This latter position he held until 1932 when failing health compelled him to retire.

All-Gas Equipment in "Model Home of America"



*Right—Model Home
bordering on Atlantic
Ocean*

*Above and below—
Gas equipment used
in the home*



Since June 22, thousands of paying visitors have trooped through the carefully planned rooms of the Model Home of America on Atlantic City's famous Boardwalk. Based on the principles of convenience, efficiency and practicability, the home utilizes modern gas equipment for cooking, refrigeration, water heating, house heating and air conditioning. It is sponsored by Oppenheimer Advertising Agency in co-operation with national manufacturers, many of whom are members of the American Gas Association.

Gas Highlights of Wisconsin Meeting

MANY interesting facts concerning gas sales problems were brought out at the record convention of the Commercial Section of the Wisconsin Utilities Association at Milwaukee, Wis., September 9-10. The following extracts of addresses before the meeting provide an excellent cross section of the discussion:

C. R. Phenicie, vice-president, Wisconsin Public Service Corp., Green Bay:

A great volume of gas and electric appliances is being sold this year by the utilities than was sold in 1929. There is a greater customer acceptance today for major appliances offered by the utilities than ever. There are a greater number of sales people employed by the public utilities today than at any time heretofore and the budgets covering merchandising, advertising and business promotion efforts are at least as great as they were in the peak of prosperity.

H. F. Patterson, Cribben & Sexton Co., Chicago:

A survey shows that the average gas range in use in the United States is six years old; 55% of these ranges do not have automatic lighters; 70% do not have temperature controls or insulation; 38% of the customers had never seen or heard of automatic lighters; 45% never heard of clock control; 55% had never seen or heard of simmer burners; 40% had never seen or heard of temperature control; 45% had never seen or heard of insulated ovens.

One can easily conclude from the above figures that there are conservatively 10,000,000 obsolete, or let's say, not modern, gas ranges in use today. Sixty per cent of the women do not know how easily they can cook in their own kitchens. This is proved by the fact that the delicatessen business has thrived so in the last ten years.

There has been found no substitute for campaign methods to increase gas range sales. It has been definitely proven during the past eight months that the greatest single factor in connection with the sale of higher priced gas ranges is convenient terms to the consumer. We have had numerous cases brought to our attention of sales campaigns in which the element of price was absent, but where extended terms were emphasized, which resulted in a volume of sales greater than any campaign conducted over a period of years by the respective companies.

Zella Patterson, home service director, Wisconsin Public Service Corp.:

Home service calls have increased 25% due to more baking, canning and cooking in the home, and likewise telephone calls have increased 25%. Attendance at home service classes has increased considerably due to the interest of the housewife in learning to use her equipment as advantageously as possible and overcoming the rising cost of foodstuffs.

L. A. Dubberke, manager, hotel department, Milwaukee Gas Light Co.:

The rehabilitation of commercial kitchens is without question the important factor upon which our future extension in commercial cooking depends.

In 1935, our selling job is an easier and a more simple one because of the variety of equipment from which to make a choice.

This new equipment, with a more scientific utilization of our fuel, provides greater benefits and more profit to those who cook in volume. The automatic features of appliances of today are the real eliminators of food loss in volume cooking. The commercial kitchen is the place to eliminate pot-watching—for the larger the pot, the greater the loss if a good batch of food is ruined.

The plan we employ has been to make a thorough study and analysis of a kitchen so that we are able to assure the owner of a sizeable fuel saving, as well as other direct benefits. Each kitchen must be treated as a specific case. Study the cooking load and process as now carried on in a specific kitchen while in operation and you will find it easy to recommend proper equipment in proper sequence location to save a maximum in time, fuel, steps, food, space, etc. Set submeters to ascertain the gas consumption of each piece of equipment—oven and top separately. Hours of operation should be studied and the method of preparation observed, secure the number of meals per month and determine the cost per meal. Broiling methods should be carefully noted to see whether the cost can be reduced through the installation of a salamander or small off-peak broiler. Specialized pieces of equipment should be recommended where economy can be effected through its use. Coffee urns and steam tables should be equipped with thermostats to conserve fuel, as well as to prevent over-heating.

Isn't it reasonable to admit that the things most needed today in the rehabilitation of commercial kitchens are salesmanship and publicity, backed up by adequate and efficient maintenance? Let us attack this proposition with enthusiasm and determine to resell the entire

cooking in volume users of our service on the basis of a lower operating cost.

W. V. Rife, president, Miss America Heater Corp., Chicago:

Pushing of gas hair dryer sales will have three distinct benefits to the gas companies: first, there is a commercial profit to be had from the sale of the dryer; second, there is the load-building feature, and third, the advertising value. The advertising value of the gas hair dryer is worth more in a sales way to the gas industry than the commercial profit and the actual individual load-building element. I have positive proofs of this statement.

The average gas hair dryer will produce for the gas company an additional load of approximately five to fifteen dollars a month. Therefore, striking an average of eight dollars a month, twelve months in a year, the 100,000 or more beauty shops would produce an added annual income of approximately ten millions of dollars.

J. H. Fagan, Fagan Andrews Co., Milwaukee:

A tank heater equipped with a lighter produces more revenue than same types of low demand automatic water heaters; renders a more satisfactory service to the customer, and does not necessitate rate reductions or the establishment of a special water heating rate to get the business. It does a job the customer is willing to pay for on the existing rates, makes his equipment a unit that does not limit his use of hot water to 30, 50 or 60 gallons per day.

C. A. Debell, commercial manager, Wisconsin Public Service Corp., Sheboygan:

When the first air-cooled refrigerator was introduced, we started a study of our local refrigeration market. In 1934 when we saw the new beautiful line and noted that business conditions in general were really showing marked signs of improvement we decided to spend some money and go to work. A survey was then made of the entire territory. Our men went into about 10,000 homes and when we had completed same we knew what type of appliance every customer had or didn't have. From our survey we selected all names of customers who were using ice boxes and those whom we thought would be good prospects and at regular intervals would send them carefully prepared letters telling them of the many features we had to offer in an Electrolux refrigerator and why they should buy. We backed this up with a steady stream of newspaper advertising

and occasional radio broadcasts. We built attractive indoor and outdoor displays.

W. E. Stark, The Bryant Heater Co., Cleveland:

Standardized gas-burning equipment for application to air conditioning has been designed and put on the market and is now ready for over-the-counter sales.

Within only a few months there has been better than a 100% increase in gas-fired air conditioning installations.

Chas. G. Grau, manager, Oneida Gas Co., Rhinelander:

Water heaters are the one best bet for load building and at the same time making a good gas booster out of your customer.

Previous to June, 1934, we were satisfied to have our customers use the old

type side-arm heater but with competition getting keener it became apparent that if we wanted to keep our water heating business it would be necessary to make a special water heating rate subject to some piece of appliance that would give us additional load and the only thing I could see that would do that for us was the automatic storage type of heater.

At first we concentrated our efforts on our customers who were running exceptionally large gas bills, for we knew that under our new rate a good proportion of their cooking load would come into the water heating bracket and in this case they could install an automatic, have a 24-hour hot water supply and not increase their monthly bills and probably in some cases cut them down.

This worked out just about the way we had it figured and it created a bunch of satisfied customers not only from the angle of service but from the amount

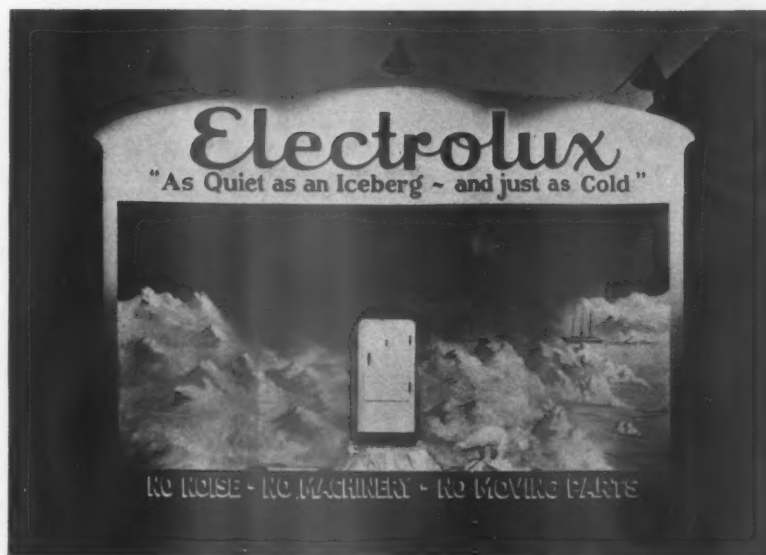
of their bills for they realized we were giving them something they never had before.

Instead of installing these heaters for a dollar down and a dollar a month, we installed them on a thirty-day free trial and if then satisfied they were billed a dollar a month on their gas bill until the heater was paid in full.

Our experience has been that on the long-term plan the customer has been more prompt in paying than they were where the payments were larger and only spread over a twelve months' period.

At the present time we have close to 20% saturation of automatic water heaters on the total number of meters in service which I believe is something to be rather proud of, but the interesting part of the whole story is that we have increased our daily send-out approximately 18% over the same period as last year before the heaters were installed.

Unique Outdoor Display Boosts Refrigerator Sales



THE Wisconsin Public Service Corporation at Sheboygan, Wisconsin, is completing the most successful gas refrigeration promotional campaign ever conducted in that division.

In addition to a well-planned newspaper and direct-by-mail advertising program, the company has made exceptional use of window display and outdoor advertising. One of the most unique outdoor displays used was that depicting an Arctic scene. The company erected on the lawn of their property adjoining the office and facing on the main street, a large "shadow box" display. The extreme height of the structure was 15 feet and the width 18 feet. The inside back-

ground was 12 x 12 feet and the wings were 8 x 12 feet. The framework consists of two by fours properly braced. The walls are covered with beaver board and the ceiling with matched boards and tar paper.

The background consists of a tumbling mass of icebergs. To the right of them is shown a ship frozen in the ice. Next to the ship the outline of a dog sled and several men are visible. The Aurora Borealis faintly lights up the sky. In the foreground a real stock model of a 5 cu.ft. Electrolux refrigerator is mounted on a snow-covered iceberg. Next to it a large paper maché polar bear is shown gazing rather quizzically at the refrigera-

tor. At night concealed lighting controlled by a time clock is used. Blue bulbs are employed to give the picture as frigid an appearance as possible. The printed matter tells the story.

A. C. Davey, new business manager, feels that this outdoor advertising has assisted materially in the selling of gas refrigeration in Sheboygan.

"The motif is not new," Mr. Davey stated, "but the outstanding beauty of the artwork and lighting effects, however, have succeeded in eliminating any taint of the commonplace. In the parlance of the advertising man this display does 'stop them.'"

Gas Revenues Increase 5.2 Per Cent in July

MANUFACTURED and natural gas utility revenues amounted to \$49,079,600, in July 1935, as compared with \$46,635,400, for the corresponding month of 1934, an increase of 5.2 per cent.

The manufactured gas industry reported revenues of \$28,824,000 for the month, an increase of 2.2 per cent over the same month of the preceding year. The natural gas utilities reported revenues of \$20,255,600, or 9.8 per cent more than for July 1934.

Total sales of manufactured gas for the month were 26,674,500,000 cubic feet, an increase of 5.3 per cent. Natural gas utility sales for the month amounted to 65,110,100,000 cubic feet, an increase of 8.4 per cent.

Revenues from gas sales for domestic uses, such as cooking, water-heating, refrigeration, etc., continued to improve, running 4.2 per cent above July 1934. Revenues from industrial-commercial uses also gained during the month, the increase from this class of business amounting to 7.6 per cent.

Affiliated Association Activities

Pacific Coast Gas Association



Wm. Moeller, Jr.

THE gas industry on the Pacific Coast showed its virility by breaking all records in attendance and interest at the forty-second annual convention of the Pacific Coast Gas Association held in Pasadena, September 17, 18 and 19.

At the opening session Wm. Moeller Jr., president of the Association, made an inspiring speech declaring that the depression is over and calling upon gas companies and manufacturers to unite in a well organized plan for the promotion of gas and gas appliance sales. H. M. Crawford, the newly elected president, pledged himself to carry on the plans formulated by Mr. Moeller.



H. M. Crawford

Others elected to office in the Association were Jas. F. Pollard, vice-president and general manager of the Seattle Gas Company, as vice-president, and D. G. Martin, general auditor of the Pacific Gas and Electric Company, treasurer. New members on the Board of Directors are:

E. H. Coe, vice-president and general manager, Central Arizona Light and Power Co.

E. L. Hall, operating manager, Portland Gas and Coke Co.

A. E. Holloway, vice-president in charge of sales, San Diego Consolidated Gas and Electric Co.

H. L. Masser, vice-president and asst. general manager, Los Angeles Gas and Electric Corp.

Mr. Moeller as past president stays on the Board.

Mr. Crawford announced that Lester E. Green, of the Los Angeles Gas and Electric Corporation, had been appointed chairman of the Accounting Section; W. M. Jacobs, of the Southern California Gas Company, chairman of the Sales and Advertising Section; and P. E. Beckman, of the Pacific Gas and Electric Company, chairman of the Technical Section. W. J. Bailey, president of the Day and Night Water Heater Company, was elected chairman of the Manufacturers Section.

Several amendments were made to the Association's By-laws including one abolishing

Convention Calendar

OCTOBER

4-5 Empire State Gas & Electric Association
Westchester Country Club, Rye, N. Y.

14-17 American Gas Association
Palmer House, Chicago, Ill.

14-18 National Association of Railroad and Utilities Commissioners
Nashville, Tenn.

14-18 Twenty-Fourth Annual Safety Congress
Louisville, Ky.

NOVEMBER

11-14 American Petroleum Institute
Biltmore Hotel, Los Angeles, Calif.

ing the Public Relations and the Publicity and Advertising Sections. The Public Relations Section will be replaced by an Educational Committee headed for the coming year by E. G. McCann, personnel manager of the Pacific Gas and Electric Company. The Publicity and Advertising Section has been merged with the Commercial Section in the newly named Sales and Advertising Section.

The convention program was instructive throughout. It ended on the evening of September 19 with a banquet and dinner dance at the Huntington Hotel. The annual Golf Tournament of the Association was played on September 20 following which many of those attending the convention joined a caravan to San Diego to attend the California Pacific International Exposition. September 21 was Gas Appliances Day at the Exposition featured by a mammoth outdoor cooking demonstration held in the Ford Bowl.

Wisconsin Utilities Association

WISCONSIN utilitarians again demonstrated their alert sales-mindedness at the Commercial Section convention, September 9 and 10, at the Schroeder Hotel, Milwaukee, Wisconsin.

The meeting duplicated the success of the previous year when all attendance records were broken. The registered attendance was 358 as compared with 356 in 1934; the number of exhibitors jumped from 43 to 47. An excellent program ably augmented by comprehensive displays of manufacturing companies earned general appreciation. Chairman S. L. Hagen presided.

Howard W. Cooper, vice-president of Wisconsin Power and Light Co., Madison, was elected chairman of the Commercial Section, and Ross Williams, sales manager of Wisconsin Michigan Power Co., Appleton, was elected vice-chairman.

G. V. York, of Eau Claire, president of the Association set the keynote of the convention when he called for better service, new uses, new methods, understandable rates and general simplification of business relations with customers. "To do this best," he stated, "all phases of commercial life in these utilities must be aggressive, modern, alive, and must move in direct lines toward these objectives."

The section of the program devoted to the objective of increasing gas sales consisted of many noteworthy contributions by speakers of prominence. The highlights of these addresses are included elsewhere in this issue of THE MONTHLY.

Elected Honorary Member

ANNOUNCEMENT has been made of the election of P. S. Young, president of the American Gas Association, to honorary membership in the Danish Gas Association. H. Hensen is president of the Danish Association which is called Dansk Gasteknisk Forening. Membership is for the term 1935-36.

T. L. Kemp To Manage Indianapolis Utility

FOLLOWING the transfer of property of the Citizens Gas Company, September 9, to the city of Indianapolis, Ind., involving a change in name to the Citizens Gas and Coke Utility, it was announced that Thomas L. Kemp, of Terre Haute, veteran in the gas utility field, had been appointed manager.

Mr. Kemp has been connected with operations in the gas and coke industry for more than thirty years in executive capacities. He directed the construction of a number of coke oven plants including the one at Indianapolis. Prior to his present appointment, Mr. Kemp was employed as vice-president and manager of the Indiana Consumers Gas and By-Products Company.

He is a member of the American Gas Association and is now serving on Managing Committee of the Technical Section. He is also a member and former president of the Indiana Gas Association, a member of the Chicago Blast Furnace and Coke Men's Association and the American Chemical Society.

Fee Reduced for Natural Gas Home Study Course

THE enrollment fee for the Home Study Course on Natural Gas conducted by The University of Kansas under the auspices of the Natural Gas Department of the American Gas Association has been reduced. In announcing the reduction, Harold G. Ingham, Director of the University's Extension Division, stated:

"At the time the course was initiated, we informed representatives of the American Gas Association that it would be necessary for us to make it entirely self-supporting, but that we did not desire to accumulate a surplus above actual cost. The greatly increased enrollments in recent months have enabled us to effect economies in both instructional and administrative costs. Although our expense for the previous six months was much greater, we feel that we are safe in assuming that the volume of enrollments and students' reports will be maintained at the present level. On this basis, we are making a reduction of 10%, which reduces the fee to \$54 for members of the A. G. A. and employees of member companies. For others, the reduction is proportional, making the fee \$72, when paid in advance, or \$74.50 on the installment plan."

All students at present enrolled in the course will receive the benefit of this reduction by refunds. Checks have already been sent to most and the remainder will go forward at an early date.

The course is meeting with unusual satisfaction. Professor Young, under whose direction the course is conducted, has received numerous favorable comments from students now taking the course. Recently an employee of the meter department of a sizable gas company wrote: "After having worked on the gas course for approximately a month, I am more enthusiastic than before. I shall not hesitate to urge all my fellow workers in the department to take the course."

The Advisory Committee, made up of four eminent natural gas executives who passed on all material for the course, were impressed with its clearness. That students are being similarly impressed is evidenced by the sentiments of an assistant chemist for the U. S. Geological Survey in the oil and gas development of the public domain who is taking this course:

"The course is so plain, so lucid, that one cannot help but progress rapidly through it. Every paragraph leads naturally into the next until, by the time one has read through an assignment, it takes but very little study to absorb it. I find after reading and studying the assignment, terms and definitions are so clear that, by going to my Lichy's book and studying the same subject there, it is a fairly easy matter to work out all of the formulas. Right now (after completing approxi-

mately half of the course), I can sit down and develop the orifice formula. I have commented many times on the clear explanation and the wonderful way in which the subject is developed. Professor Young has accomplished a splendid piece of work in the preparation of this course."

Professor Young takes great personal pride in helping students, not only on matters directly treated in the course, but on other phases indirectly connected with the general subject. As a result of this generous policy he has received the

Snake Charmer—With a Monkey Wrench



Courtesy Blue Blase News.

Herbert Bearden, line walker for the Ranger pipe line district of the Lone Star Gas Company, has experienced more than his share of fights with angered rattlers in that rattlesnake-infested country. He is shown in the accompanying picture with skins of three of his victims. At his feet is a mounted white rattlesnake, killed by some other person. His constant weapon of defense against snakes, a monkey wrench, is shown in his right hand

appreciation of the students. The following is a typical example:

"The instructor's remarks in his letters explaining various points are certainly helpful. They have not only cleared up questions which I had concerning some part of the lesson assignment, but have given me information and help on several subjects which were only indirectly connected with the course itself."

This is the time of the year when everyone is planning his winter's activities. Many will include the Natural Gas Course in their program. Certainly that would be a profitable undertaking for any gas man desiring to further his knowledge of his business. Association Headquarters will be delighted to send detailed information on the course to anyone interested.

C. M. Grow Retires

CHARLES M. GROW, for many years a new business manager of Southern California Gas Company, Los Angeles, retired from active service on September 1. Mr. Grow, has been a member of the Pacific Coast Gas Association since 1911 and served as chairman of the Commercial Section in 1926 and 1927.

Retirement of Mr. Grow made necessary the following changes in the company's sales organization: W. M. Jacobs becomes assistant general superintendent of sales; H. E. Davidson, sales promotion engineer; J. E. Keen, general supervisor of domestic sales; and L. M. Hull, assistant general supervisor of domestic sales.

Gas and "The Comet" Are Fastest

WHEN the new streamlined train "The Comet" inaugurated its service between Boston and Providence, J. L. Johnson, sales manager of the Providence Gas Company, was quick to realize the advertising possibilities of tying in with this popular development. Thousands of commuters now carry a handy little folder, distributed by the company, containing the time schedule of the new train. A picture of "The Comet" appears on the upper half of the outside cover of the folder while the lower half is adorned by the picture of a modern gas range. In between the pictures, in large letters, is the word "fastest." The reverse side of the folder carries another picture of a modern gas range along with brief copy and the company's name.

The railroad schedule was the result of the success of a similar small folder furnished by the company to thousands of women for use as a shopping list. It ended the quest for something equally as useful for men.

More than 55,000 persons are employed at least 300 days a year in the natural gas industry.

Bibliography on Cleaning of Natural Gas

Compiled by **LUIS HILT**, Librarian,
American Gas Association

- Solid and liquid impurities in natural gas and means for their removal—Pacific Coast Gas Association Proceedings—1923: 720-32.
- Discussion on removal of dirt, sand, etc. from pipe lines—Natural Gas Association Proceedings—1926: 117-120.
- Cleaning of natural gas—American Gas Journal—June 18, 1927: 608—11, H. B. Milam; Same. Natural Gas—June 1927: 12.
- (Manufactured Gas)
- Dust and moisture control—K. C. Tomlinson—Pacific Coast Gas Association Proc. 1927: 339-354; Same. Gas Age, Nov. 26, 1927: 811-14, 817-8.
- Recent progress in gas distribution—Natural Gas—April 1928: 46—C. W. Robins.
- Bringing dust problems under control—R. C. Boughton—Western Gas, May 1928: 42-3 & 66.
- Natural gas transmission problems—Oil & Gas Journal—August 30, 1928: T-191-97.
- Solving our dust problems—E. F. Schmidt & D. A. Sillers—Natural Gas, Oct. 1929: 17, 70 and 74.
- Cleaning natural gas—N. D. Holman—Western Gas, April 1930: 28; Same. Gas Age, May 24, 1930: 777-9.

- Method for removal of dust from natural gas pipe lines—W. J. Miskella—Oil & Gas Journal, March 19, 1931: 56.
- Origin of dust and its elimination—D. A. Sillers—Natural Gas Department Proceedings 1931: 170-3; Discussion p. 174-7; Same—Oil & Gas Journal, May 14, 1931: 63 & 101. Gas Age, May 23, 1931: 805-7.
- Dust problem and its relation to the distribution of gas (Question box)—D. A. Sillers—Natural Gas Dept. Proc., 1932: 128-9.
- Recovery of dust from natural gas lines—D. L. Darnell—Gas Age, June 11, 1932: 723-5.
- Review of methods for the determination of dust in gas (Bibliography on determination of dust in air and gases)—L. Shnidman—A. G. A. Prod. & Chem. Conf. Paper, May 23, 1933.
- Dust problem—L. Shnidman—A. G. A. Prod. & Chem. Conf. Paper, May 22, 1934; Same. Gas Age, June 9, 1934: 563-8.
- Dust stoppage of pilot orifices—G. Corfield—Western Gas, April 1934: 14-15 and 38.
- Gas main dust; its causes, characteristics and remedies—T. G. Wallace & G. Corfield—Western Gas, January 1935: 8-11, 36 & 38.
- Some experiments in the design of liquid and dust separators—B. M. Lulhere—Western Gas, January 1935: 17-8.

Manufacturers to Display Restaurant Equipment

AN exhibit of the American Gas Association will be a feature of the seventeenth annual convention and exposition of the National Restaurant Association to be held in Chicago, October 7-11. The National Restaurant Mart, scene of the convention, will have 50,000 sq. ft. of floor space devoted to elaborate exhibits of restaurant equipment and food supplies.

In addition to the Association, the following manufacturer members are participating in the exhibit. American Stove Co., Coleman Lamp and Stove Co., Detroit-Michigan Stove Co., International Nickel Co., Inc., Majestic Mfg. Co., National Cash Register Co., Republic Steel Corp., Savory, Inc., and Standard Gas Equipment Corp.

Natural Gas for Detroit

THE Detroit City Gas Company has concluded a 15-year contract with the Panhandle Eastern Pipe Line Company (Columbia Gas & Electric Company) for the purchase of natural gas to be distributed in Detroit beginning July 1, 1936. President William G. Woolfolk announced that the company will

purchase 90,000,000 cu.ft. of Texas gas daily. It is reported that the company will continue to manufacture some high B.t.u. gas.

The project, it is stated, will require the extension for 300 miles of a 24" pipe line plus expenditures by the Detroit City Gas Company to fit in its distribution facilities, making a total cost of approximately \$20,000,000.

New Book Denounces Government Program

D.APPLETON-CENTURY COMPANY, New York, announces for publication, October 1 "You, Utilities and the Government" by Ernest Greenwood, author of "Spenders All," "The Great Delusion," and other books.

In his latest book, Mr. Greenwood deals with the Government's utility program and, in the words of the publishers, makes the following charges:

"That the Wheeler-Rayburn Utilities Bill is the culmination of the Administration's plan to destroy privately owned utilities.

"That this bill makes the utilities the spear-head of a movement to destroy large-scale business in the U. S.

"That the attack upon the utilities is the first step in giving the Constitution and our present form of democratic government the traditional 'works.'"

In an advance notice to the book trade, the publishers declare that Mr. Greenwood's contribution "is a sizzling, dramatic, significant book, which is sure to be the basis of many news stories and to cause heated arguments wherever it is read."

The price of the book is \$2.00 at all book stores on and after October 1.

C. E. Wetzel Dies Suddenly

CHARLES E. WETZEL, advertising manager of The United Gas Improvement Company, Philadelphia, died suddenly September 21.

Mr. Wetzel was formerly a member of the Managing Committee of the Publicity and Advertising Section of the Association and served on the Advisory Board of the A. G. A. MONTHLY. He was widely known in public utility advertising circles.

New Committee Reports Substantial Progress

By **L. B. CROSSMAN**

Chairman, Chemical Industries Committee

THE Chemical Industries Committee was originated during the past year for the purpose of securing data relative to the use of gas fuel in chemical plants and to promote the use of gas-fired equipment throughout the chemical industry.

In spite of the fact that committee members found it extremely difficult to secure authentic data pertaining to existing installations, twelve completed data sheets were nevertheless returned to the committee chairman, who in turn forwarded them to A. G. A. Headquarters for disposition.

A list of plants where data were secured, together with the committee members responsible for the securing of this data, follows:

R. Jerge, Niagara Falls Gas & Electric Company, Niagara Falls, New York

USL Battery Corporation, Highland Avenue, Niagara Falls, New York

W. Ralston & Company, Incorporated, 921 Whirlpool Street, Niagara Falls, New York

E. I. Dupont de Nemours—R & H Chemical Department, Niagara Falls, New York

E. I. Dupont de Nemours—R & H Chemical Department, Niagara Falls, New York

Dupont—R & H Chemical Department, Niagara Falls, New York

Titanium Alloy Manufacturing Company, Hyde Park Boulevard, Niagara Falls, New York

Gilman Fanfold Company, Ltd., Buffalo Avenue, Niagara Falls, New York

W. D. Thompson, Laclede Gas Light Company, Charleston, West Virginia

Anheuser-Busch, Incorporated, 721 Pestalozzi Street, St. Louis, Missouri

W. E. Spaulding, Libbey-Owens Ford Glass Company, Charleston, West Virginia

Carbide & Carbon Chemical Corporation, South Charleston, West Virginia

E. I. DuPont de Nemours Company, Belle, West Virginia

E. B. Lissner, Public Service Electric & Gas Company, Newark, New Jersey

Ascone Electric Plating Company, 4328 Hudson Boulevard, Union City, New Jersey

General Pencil Company, 67 Fleet Street, Jersey City, New Jersey

Plumber-Dealer Sign Advertising Gas



A method of advertising through plumber-dealers which, while inexpensive, is both novel and effective, has been adopted by the Brooklyn Borough Gas Company, Coney Island, N. Y. A porcelain sign with red, white and blue letters is attached to the windows of all plumber-dealers. It reads: GAS IS BEST—Cooking—Refrigeration—House Heating—Hot Water. The letters are guaranteed for three years and installation is made by the manufacturer.

French Gas Men Honored

THE decoration of the Legion of Honour has been conferred on Monsieur P. L. Fleury, general manager of the Compagnies Réunies de Gas et d'Electricité, and Monsieur P. Bardot, president of the Lyons Bronze Manufacturers' Association, who is the proprietor of the Gray gas works.

Range Copy Uses Leisure Theme

ADOPTING the proven successful sales philosophy of selling the benefits from the use of a product, the new dealer advertising campaign of the Geo. D. Roper Corporation has been designed to emphasize leisure hours made possible by use of a modern gas range.

The "Year 'Round Vacation Sale" promotion is built around three units, a newspaper campaign for local insertion, a colorful consumer broadside, and a new window display set. The newspaper campaign consists of five advertisements with

each one telling the leisure hour story from a different angle.

Since a recent *Woman's Home Companion* survey showed that more than 90 per cent of housewives interviewed like motoring, one of the Roper advertisements has a motoring scene as the major illustration and copy angle. Two other advertisements emphasize the survey-proven desirable pastimes of golfing and tennis. The remaining two advertisements illustrate leisure time to spend with the children, and time for personal beauty care.

Gas sales on the Pacific Coast increased 17.6% and gross revenue 16.5% over the first six months of 1934

Committee Takes Charge of Radio Program

THE American Gas Association is lending its facilities to various gas companies operating in the Atlantic seaboard territory to assist them in the preliminary work of organizing for the presentation of a cooperative radio program. The direction, control and supervision of this program is being handled by a committee composed of representatives of the participating companies.

The talent to be used in the program will be John Macpherson, who has broadcast under the name of "The Mystery Chef" for the past four or five years, his recipe book being known to millions of housewives by virtue of his previous radio contract with the Davis Baking Powder Company.

Gas Securities in Demand

A DISCUSSION of the current tendency in Great Britain for investors to purchase control of operating gas companies forms the leading article in the "Gas Times" (London) for September 14.

This development has also received attention in the columns of "The Economist," of London, which in a recent article said that "old as is the making of gas from coal the tendency towards concentration in large capitalistic units has, up to the present, made far less headway than in many newer trades."

"The Economist" article draws a parallel between the gas industry and the brewing trade, in which smaller undertakings have largely been bought up. The "Gas Times" comments that there is no parallel between the public house and the gas business; "the beer trade is not a public utility nor does the consumer have to buy even the tankard from which he drinks his beer."

It is the opinion of the "Gas Times" that in the past "the investor in such sound securities as gas stocks is well content with a 5% return, while the speculator in the less secure industrial fields looks for something much higher," but that now the investor "is not looking for profit but has been driven into the gas business owing to the small return from gilt-edged securities."

R. L. Fiske Joins Crane

THE appointment of Russell L. Fisk as a member of the Premier Gas Division of the Crane Company, effective September 1, has been announced by Stanley Jenks, eastern manager. Mr. Fisk has been assigned to the Long Island City, Hempstead and Newark Branches of Crane Company and in this capacity will as field representative cover Manhattan, Long Island, Staten Island and Newark in the sale of Crane gas water heaters, boilers and conversion burners.

ACCOUNTING SECTION

A. S. CORSON, Chairman

H. W. HARTMAN, Secretary

F. L. GRIFFITH, Vice-Chairman

Keeping Meter Records

By W. J. ASHBROOK

Philadelphia Electric Co.

THE title refers to the customers' accounting clerks whose duties involve the recording and handling of data pertinent to the meter reading sheet.

The work is colorful; numerous details, the value of accuracy, the necessity of giving and receiving whole-hearted cooperation, make it so. It has that "something different every day" complex.

Errors in meter record work often cause bitter complaints, therefore, a high grade of efficiency must be maintained at all times. In addition to the usual qualifications, it is essential that clerks specialize in distinct writing, numbering, and rapid, accurate figuring. Fancy penmanship is not appropriate. The fewer "flourishes" the better; they may extend through indexes causing misinterpretations. Practice, in spare moments, of numbering 1 to 10 or writing a to z is never wasted.

The clerks must be coordinators, keen observers, and should possess the ability to visualize the action following their routine.

Duties

Many routine activities are concentrated in the group; a host of others may be routed through for some incidental action.

Duties assigned include the recording of meter sets; removals and changes; turn-ons and turn-offs; folioing; listing of history; identifying and recording special extensions; entering straggler and final bill indexes; noting safety hazards; compiling averaged bills; handling rate changes; writing special reading arrangements; following and recording gradual cease tests; checking for missed billing periods; filing new and completed sheets; counting meters read when operating on the incentive plan; arranging transportation of records; observing meter binders for condition; furnishing statistics of usage, revenue and rates when required; supplying the number of meters, active and inactive.

Meter Reading Sheet

Included in the scope of meter record work are several unoutlined or odd jobs. Not exactly the "when you don't know what to do with it" type, but rather the special requests for all sorts of information. These jobs must be handled promptly. Peaks on regular work must also be met. Versatility of the group with flexibility of procedure is the only solution. Thus, it can be realized, that resourcefulness coupled with constant alertness is necessary.

The clerical work generally starts with the receipt and filing of the new addresso-

graphed sheet. This is an opportune time to check the address for accuracy of descriptive terms. Location identification may be spelled incorrectly; East used instead of West; Street instead of Avenue, and other similar errors. Active sheets should occasionally be reviewed for this type of error.

Interested departments should be informed when a customer is to receive more than one bill so that communications of other types may be adjusted for the customer's convenience.

Meter Set Order

These orders usually show meter number, size, location, date set, security, constant, as well as special characteristics as they apply or are desired.

Most companies show the rate on the set order, this governing the Addressograph Department as to type of meter reading sheet furnished. Colored sheets are often used to indicate certain rates, or sheets of one color may be used for all rates, with appropriate symbols printed thereon. Regardless of practice, the specified rate should be checked with the sheet. The slight additional effort is worth-while.

Practically all customers' accounting systems of electric or combination companies have a follow-up on verification of constants. However, the follow-up may not terminate until after the first bill has been rendered. It is good practice always to look for this item on the order, as the first step. Entering a constant of 1 or 0 is not required by some systems, therefore, there is often a tendency to neglect reference to this detail. Omission of proper constant entries results in major errors, sometimes at the expense of the company.

Meter reading sheets covering the installation of master and submeters are cross referenced for billing purposes. Generally a master billing sheet is used when more than two meters are handled.

Meter Removals

Meter removal orders should be checked as to date, number and index. Index should be verified by comparison with previous usage or last regular reading. The shop should be contracted immediately if in doubt. Particular care is necessary when only one meter has been removed where several are in use to see that entry is made on the proper reading sheet.

Meter Changes

These differ from removals in terminology, because another meter is set, replacing the meter removed.

Changes result from tests, reduced or additional load, and defective meters. Date and index are the important items. Rarely are meters changed on the regular reading dates, therefore, the bill must be computed on the usage recorded by the two meters.

Turn-Ons and Offs

These items represent the major portion of meter record work. Seasonal activity influences the volume. Observation and thought are stressed when entering the turn-offs, because of the various notations on the sheets.

Most sheets contain billing instructions for special minimums, meter rentals and other necessary data. The turn-on must be examined closely to ascertain whether or not the same terms are to continue for the new customer.

Special Reading Arrangements

While it is preferable to have no special arrangements, because of economical operation, which is naturally reflected in rates, utilities have never hesitated to cooperate with customers. These arrangements are usually necessary because of illness in the home, elderly people being the only occupants during the day, or some characteristic which influences the living conditions of the customer. The majority of special arrangements are requests to read at certain times or on certain days, other than the regular reading date. All such notations should be canceled with the entry of the turn-off.

Supplementing reading arrangements may be instructions for the reader to wait longer than usual for acknowledgment or to ring a certain number of times. Occasionally a memorandum appears on a sheet in a reader's handwriting to "Yell loud," "Rap hard" and similar frank expressions. Occasionally a customer asks to see the reading sheet. To avoid offense, and because robust announcements are discouraged, it is preferable to change these to "Call louder" or "Knock harder."

Meter record clerks should request the meter reading department to check periodically on special reading arrangements. Living conditions of a customer may change, often making it convenient to have the meter read in normal routine. Regular readers are quick to discover these cases but they usually neglect to report them, unless specifically asked. New readers unfamiliar

(Continued on page 383)



I'M IN A HURRY

To Get My Tickets for the

ACCOUNTING SECTION

LUNCHEON CONFERENCES

at The Palmer House

Wednesday, October 16 at 12:30 P.M.

Because NO TICKETS will be SOLD AT THE DOOR

TICKETS, \$1.25 (Including Tax)

NO TICKETS SOLD AFTER 10:30 A.M., OCTOBER 16

Many To Attend Accounting Section Luncheons

INSISTENT demand by Accounting Section members has resulted in making the luncheon conferences a feature of the A. G. A. Convention at Chicago. Four conferences are scheduled—all in the Palmer House, on Wednesday, October 16.

The conferences will start promptly at 12:30 P.M.

A word about reservations! Reservation blanks have been mailed to all members of the Accounting Section to avoid last minute confusion. No tickets will be sold after 10:30 A.M. on the day of the luncheon. Those planning to attend are urged to make their reservations early, as the luncheon accommodations are limited—and tickets will be issued in the order in which applications are received.

Tickets at \$1.25 each include a fine meal, the state tax, waiter's tip and a good cigar, a real bargain indeed.

A private dining room, sufficient for the requirements of each group, will be available so that there will be ample opportunity for discussion by all present.

Each of the four conferences will be presided over by prominent members of the Section who are fully qualified to handle the specific subjects assigned to them.

Topics of interest to every member are to be covered. According to the Section Chairmen "there will be a sensible luncheon promptly at 12:30 P.M., and then amid a friendly atmosphere, the members will be able to listen to and participate in the discussion." (By the way, the rooms selected for the conferences are air-conditioned—so don't worry about the heat of the discussion bothering you.) No stenographic records will be taken and informality will be the order of the day.

The following is the "last minute" news about each of the conferences:

The Customer Accounting group will be presided over by Thomas S. Lever, Controller of The Philadelphia Gas Works Company, Philadelphia, Pa. The subjects to be considered include:

A discussion of the latest developments and trends in credits and collections, and related matters.

Billing plans for regular and final accounts which will embrace a complete discourse of the future of the "Stub" and "Register" sheet plans of customer accounting.

Accounting for house heating budget plans.

Methods employed in refunding consumers' deposit interest periodically.

Descriptive matter on addressograph plates.

Bill delivery methods.

Methods of adjusting customers' accounts for fast and slow test meters.

Steps in reviewing customers' accounts for increases and decreases in consumption.

Do Accounting Section reports assist your company in its problems?

If this is down your alley, it's the Customer Accounting Group luncheon for you.

The General Accounting group will meet with Francis Flahive, treasurer of the Columbia Gas & Electric Corporation, New York, N. Y., in the chair. The subjects to be considered are:

Stores expense percentage policies for materials returned.

Internal audits.

Cooperation with outside auditors to reduce expenses to a minimum.

Fixed capital records in all its phases.

Treatments of cash discounts.

Accounting for leased appliances.

Reports to regulatory bodies.

Contributions for extensions.

Interest during construction.

Cost of gas by types of service.

Transportation costs charged on a mileage or hourly basis.

All of the various phases of these subjects will be placed in the spotlight.

The Office Management group, which will meet under the leadership of Dwight Griffin, assistant to the president of the Public Service Company of Northern Illinois, Chicago, Illinois, is looking forward to a red hot battle when the fol-

lowing topics are brought up for consideration:

The use of office personnel as salesmen in off-time hours.

Employees' suggestion plans.

The machine as an office problem.

Have we given sufficient consideration to the application of machines for Stores, General, Customer and Payroll Accounting?

Is there a tendency to over-mechanize billing operations?

Stationary standardization problems.

Employee production records.

Use of graphic charts.

Various phases of personnel problems.

Centralized Departments for stenographic and computing work.

Those attending the Customer Relations group luncheon will find Edward P. Prezzano, vice-president of the Westchester Lighting Company, Mount Vernon, New York, at the helm. The topics to be considered are:

Reduction or elimination of appliance service rates.

Customer deposit policies.

Selection of employees for customer contact positions.

Estimated readings—affect on relations with customers.

Limitations of authority of contact employees.

Centralization or decentralization of contact employees (orders, credits, collections, high bills, etc.).

Use of "courtesy credit" cards.

Value of House Organ and Customer Bulletins in improving relations with customers.

The use of the word "Complaint."

The use of "degree day" method of interpreting customers' bills.

In brief, there is something for everybody. Every company should have representatives at each luncheon. The Committee in charge is looking forward to a large attendance. Come and be prepared for an enjoyable and profitable afternoon.

Don't forget—No tickets will be sold after 10:30 A.M. on October 16th.

COMMERCIAL SECTION

F. M. ROSENKRANS, Chairman

J. W. WEST, Jr., Secretary

C. E. BENNETT, Vice-Chairman

Georgia Campaign Nets Record Gas Range Sales

SELLING 3,256 gas ranges in six weeks, the Atlanta Gas Light Company and affiliated properties judge their recent Seventh Annual Old Stove Roundup one of the finest sales promotion jobs in the history of the company. This group of properties, of which W. W. Winter is president, sold close to 4 per cent of their domestic meters during that period. Every division exceeded its quota, some by as much as 288 per cent.

During the entire campaign, the sales departments of all companies received the highest type of cooperation from other departments, both in turning in prospects and in handling orders after they were obtained. Wholehearted cooperation from every employee is believed to have been responsible for the unusual success of the campaign.

The figures shown below tell the complete story. Note particularly the excess of actual sales over quotas.

GAS RANGE SALES

Properties	Quota	Gas Company		Others		Total
		Heat Control	Non Control	Heat Control	Non Control	
Anniston	36	21	0	29	27	77
Decatur	9	3	0	9	3	15
Gadsden	34	8	0	64	6	78
Huntsville	9	0	0	8	2	10
Mobile	168	104	15	131	21	271
Montgomery	114	22	0	176	45	243
Selma	28	33	0	13	4	50
Tuscaloosa	39	1	0	31	22	54
	437	192	15	461	130	798
Aiken	3	2	0	4	4	10
Athens	14	27	0	44	25	96
Augusta	68	2	1	138	54	195
Brunswick	16	64	1	23	4	92
Griffin	17	10	3	19	4	36
Key West	25	3	0	10	8	21
Macon	120	94	32	156	42	324
Rome	29	18	2	22	11	53
Valdesta	14	1	0	36	9	46
Waycross	11	4	0	35	1	40
West Palm	49	37	0	22	59	118
Georgia Natural	40	55	4	67	11	137
	406	317	43	576	232	1,168
Atlanta	878	249	153	771	117	1,290
Grand Total	1,721	758	211	1,808	479	3,256

Commercial Section Plans Early Start

EARLY in May, the incoming officers of the Commercial Section, C. E. Bennett and F. M. Banks, laid plans for prompt inauguration of the Section's activities at the conclusion of the coming Convention in Chicago in October. A general outline of the proposed sectional activities was presented to a special policy committee composed of leading executives at a meeting held in Atlantic City on May 31. The recommendations of this committee were incorporated in a general program outlining the activities of the Section for 1935-1936.

The membership of the Managing Committee has been completed and the first meeting will be held at the Palmer House, Chicago, on the day following the Convention—Friday, October 18. This has been arranged so as to facilitate an early start in the Section's activities and also to reduce the expenditure of time and money necessary on the part of members in attending the meeting.

Chairmen have been selected for the following committees and others will be announced shortly:

Domestic Range Committee—R. J. Rutherford, New England Gas & Electric Association, Cambridge, Mass.

Water Heating Committee—R. A. Koehler, Public Service Electric & Gas Co., Newark, N. J.

Refrigeration Committee—B. H. Gardner, The Gas and Electric Appliance Co., Columbus, Ohio.

Home Service Committee—Beatrice C. Wagner, The Philadelphia Gas Works Co., Philadelphia, Pa.

Home Modernization Committee—H. Swenson, The Peoples Gas Light & Coke Co., Chicago, Ill.

House Heating and Air Conditioning Committee—H. O. Loebell, Natural Gas Pipeline Co. of America, Chicago, Ill.

Appliance Servicing Committee—James R. McQueen, Washington Gas Light Co., Washington, D. C.

Appliance Financing Committee—Merrill E. Skinner, Niagara-Hudson Power Corp., Buffalo, N. Y.

Among the new activities under consideration is the holding of a water heater sales contest during 1936, in addition to repetition of past sales contests sponsored by the Domestic Range and Refrigeration Committees.

The Southern Counties Gas Company, Los Angeles, Calif., reports that there are 4,344 gas refrigerators on its lines for each 100 meters

Safety Pamphlets Available

SUBCOMMITTEES of the Accident Prevention Committee have recently produced two publications of interest to member companies and especially to those in charge of safety and accident prevention work.

One of these publications, "Suggested Safe Practices for Welding in the Properties of Gas Utilities Companies," was prepared after consultation with members of the Technical Section of the Association and representatives of other organizations interested in welding procedures.

A subcommittee, under the chairmanship of W. J. McVay, Consolidated Electric and Gas Company, New York, N. Y., has prepared a bulletin outlining a series of programs on safety and accident prevention. The topics outlined discuss such matters as house keeping, falls of persons, hand-tools, protective devices, handling material and operation of automotive equipment.

Inquiry for copies of these publications should be addressed to the Secretary of the Accident Prevention Committee, Association Headquarters.

INDUSTRIAL GAS SECTION

J. F. QUINN, Chairman

C. W. BERGHORN, Secretary

C. W. GALE, Vice-Chairman

Supplementary Industrial Bibliography

ARTICLES presented here have been selected from the trade literature to illustrate recent developments in gas heat application.

Testing of insulating refractories continues to occupy the attention of research laboratories which are gradually building up complete data on their properties. Accurate information on the specific heat, thermal conductivity and strength of these materials is now available to the furnace designer. The subject of gas engine power continues to attract attention. Recent reports include discussions of the possible improvements in gas engines, the adoption of auto engines for use with gas fuel and some operating hints from field installations.

The acceptance of radiant tube heating is shown by two new installations describing their application to hardening furnaces,

By J. M. KRAPPE
American Gas Association

with prospects for their application to other fields of heat treating including the treatment of malleable iron, non-ferrous alloys and enamel ware. An external unit supplies a reformed gas atmosphere to these furnaces. Other examples of atmosphere control include applications to carburizing and hardening furnaces in an auto plant. In this bibliography all of the recent articles on furnace atmospheres for steel treating have been assembled in a new classification for easy reference. In the field of non-ferrous metal treating two new instances of the application of atmosphere control are reported.

Commercial kitchens which have installed modern heat controlled and insulated equip-

ment are reporting favorable results. Increased cooking capacity and real economy are being obtained by replacement of obsolete equipment.

Activity in the field of ceramics is reflected in a number of technical articles describing natural gas application to glass furnaces, and to brick and pottery firing. Complete descriptions of those plants adopting the continuous circular type kiln in place of periodic type kilns are available.

A radiant tube furnace for vitreous enameling has been successfully applied in England. An oven type furnace equipped with refractory radiant tubes has been in operation for some time and shows advantages over the older muffle type of furnace. High production is maintained without forcing and considerable economy is promised due to reduced heat losses from the furnace.

GENERAL DATA—A

Combustion A-3

Gas Age-Record

The combustion of carbureted water gas in luminous flames.....Aug. 10, '35 p. 109

Steel

Gas combustion data.....June 10, '35 p. 30
(Excess oxygen in flue gas to obtain complete combustion for two types of industrial burners.)

Furnace Design A-5

Heat Treating and Forging

Application of insulation refractories to industrial furnaces.....March 1935 p. 144
(The minor disadvantages of the new materials include tendency to spall, gas leakage, poor abrasion and slag resistance.)

Heat Treating and Forging

A new light weight refractory concrete.....July 1935 p. 343
(Alumina base refractory capable of withstanding temperatures up to 2400 deg. F. is poured like concrete into any desired shape.)

Industrial Gas

A new deal for industrial furnace refractories.....March 1935 p. 14

Jour. Amer. Ceramic Soc.

An apparatus for measuring the thermal conductivity of refractories at high temperatures.....Jan. 1935 p. 6
(Results for insulating fire brick, silica brick and dense clay firebrick.)

Jour. Amer. Ceramic Soc.

Insulating refractories.....Jan. 1935 p. 13
(Characteristics—heat savings.)

Jour. Amer. Ceramic Soc.

Physical properties of some insulating brick.....Jan. 1935 p. 18

Steel

Anticipating future demands upon continuous heating furnaces.....June 17, '35 p. 30
(Past design developments and possibilities for future improvement.)

Heat Transfer A-7

Iron Age

Heat and cold insulation—a new field of application for sheet steel.....Jan. 17, '35 p. 9
(Use of metallic surfaces of low emissivity.)

Varnish Boiling A-10

Industrial Gas

Cost reduction in varnish firing.....May 1935 p. 7
(Coke and oil firing vs. gas.)

Industrial Gas

How varnish making costs can be cut.....Aug. 1935 p. 9
(Heating up and holding test data.)

Heating Liquids A-12

Industrial Gas

Heating electroplating tanks with lead immersion coils.....April 1935 p. 20

Miscellaneous A-14

Amer. Gas Assoc. Mo.

Gas solves greenhouse heating problems...July 1935 p. 250

Industrial Gas

Dehumidifying with gas in the printing industry.....March 1935 p. 7

Natural Gas

The industrial gas sales engineer.....June 1935 p. 34
(The characteristics of the sales engineer and an explanation of his activities.)

Gas Engines A-15

Gas Age-Record

Gas engines for power.....May 11, '35 p. 469

Natural Gas

Gas engines for power.....March 1935 p. 18
(Types and sizes available.)

Natural Gas

Development of auto engine power unit.....May 1935 p. 86
(Automobile engine for ammonia compressor.)

Oil and Gas Journal

Modern developments in design of gas engines lower operating cost.....March 7, '35 p. 17

Power		
Oil and gas engines.....	April 1935	p. 179
(Maintenance policies.)		
Western Gas		
Compression ratio efficiency relation in a gas engine.....	Feb. 1935	p. 13
Unit Heaters A-20		
American Gas Journal		
New direct fired gas heating installation....	May 1935	p. 56
(Direct fired forced circulation air heater with a filter.)		
Heating and Ventilating		
Military airport heated with gas.....	Aug. 1935	p. 28
(Floor type unit heaters.)		
Industrial Gas		
A new type of heating system for an automotive body plant.....	May 1935	p. 13
(Direct-fired forced circulation air heaters with a filter.)		
Western Gas		
Calculating unit heater operating costs.....	April 1935	p. 19

HEAT TREATMENT OF FERROUS METALS—B

Forging B-1		
Industrial Gas		
Increasing operating economy at forging temperature	Jan. 1935	p. 21
(Air preheater built into small slot type forge.)		
Hardening B-2		
Industrial Gas		
Hardening and drawing automotive spring leaves	Aug. 1935	p. 7
(Diffusion flame combustion in radiant tube heaters.)		
Metal Progress		
Heat treatment of spring leaves.....	March 1935	p. 51
(Continuous furnace heated by diffusion flame in radiant tubes. Reformed gas atmosphere and door curtains used.)		
Steel		
Hardening tool steels in controlled atmospheres	June 24, '35	p. 30
(Best atmosphere for box type, open gas furnace and retort type furnace.)		
Annealing B-3		
Industrial Gas		
Stress relieving is perfected for large welded vessels	Feb. 1935	p. 21
(Temperatures and rate of heating controlled in car type furnace.)		
Drawing after Hardening B-4		
Industrial Heating		
Continuous air drawing of roller bearings using the air heater method.....	April 1935	p. 205
Case Hardening B-5		
Heat Treating and Forging		
Carburizing with gas.....	July 1935	p. 327
(Combination of raw natural and reformed city gas used as a carburizing medium.)		
Miscellaneous B-11		
Heat Treating and Forging		
The time required for heating steel.....	Feb. 1935	p. 63
	March 1935	p. 117
(Data for square bars.)		
Furnace Atmospheres B-12		
Heat Treating and Forging		
Effect of oxygen and sulphur in scaling....	June 1935	p. 275
(Paper, British Iron and Steel Institute.)		
Heat Treating and Forging		
Causes of a decarbonized outer skin.....	June 1935	p. 283
Industrial Gas		
Hardening and drawing automotive spring leaves	Aug. 1935	p. 7
(Diffusion flame combustion in radiant tube heaters.)		

Metal Progress		
Heat treatment of spring leaves.....	March 1935	p. 51
(Continuous furnace heated by diffusion flame in radiant tubes. Reformed gas atmosphere and door curtains used.)		
Metal Progress		
Atmosphere control in radiant tube furnaces	Aug. 1935	p. 41
(Diffusion combustion in alloy tubes gives radiant elements for the economical heating of steel, malleable, non-ferrous alloys and enamel ware in controlled atmospheres.)		
Metals and Alloys		
Controlled atmospheres in steel treating....	Aug. 1935	p. 195
(Part 1—A correlated abstract restricted to a consideration of plain carbon steels in various atmospheres.)		
Steel		
Atmospheres controlled in new furnaces at auto plant.....	April 15, '35	p. 38
(Controlled atmosphere furnaces for carburizing and hardening.)		
Steel		
Hardening tool steels in controlled atmospheres	June 24, '35	p. 30
(Best atmosphere for box type open gas furnace and retort type furnace.)		

HEAT TREATMENT OF NON-FERROUS METALS—C

Copper C-1		
Industrial Gas		
Continuous bright-annealing of copper tubing	Feb. 1935	p. 13
(Controlled atmosphere bright annealing furnace eliminates pickling, saves in operating cost.)		
Brass C-2		
Gas Age-Record		
The bright annealing of non-ferrous metals	April 27, '35	p. 409
(Products of combustion of manufactured gas are utilized for a non-oxidizing atmosphere.)		
Miscellaneous C-7		
American Gas Assoc. Monthly		
Non-ferrous metal treating with gas.....	Aug. 1935	p. 295

METAL MELTING—D

Brass and Bronze D-1		
Gas World		
Some aspects of town gas for industrial purposes	Feb. 16, '35	p. 13
(Operating results on brass melting.)		
Industrial Gas		
Making brass melting efficient.....	May 1935	p. 9
(Insulating refractory shows economies on 200 lb. crucible furnaces.)		
Monel D-4		
Foundry		
Melt metals with natural gas.....	May 1935	p. 24
(Converted crucible furnace for high nickel content mixtures.)		
Aluminum D-7		
Foundry		
Melting conditions of aluminum.....	March 1935	p. 21
(Running quality as affected by pouring temperature and type of furnace.)		
Soft Metal Melting D-10		
Gas Age-Record		
White metal melting with controlled heat..	Mar. 16, '35	p. 233
(Radiant heat burner application.)		
Industrial Gas		
Economy in electrotpe melting.....	Feb. 1935	p. 9
(Description of process. Method of applying gas.)		
Tinning D-11		
Iron and Steel Engineer		
Theory and practice of immersion heating with gaseous fuels.....	March 1935	p. 167
(Tinning, stereotype, can manufacture applications.)		

Iron and Steel D-12

- Iron and Steel Engineer
Automatic control and use of fuels in steel
mill furnaces.....March 1935 p. 149

Miscellaneous D-13

- Foundry
Melting control reduces losses.....Jan. 1935 p. 22
(Oxidizing rather than reducing atmospheres
recommended for non-ferrous metals.)

INDUSTRIAL STEAM APPLICATIONS—E**Industrial Boilers E-1**

- American Gas Journal
Summer steam for a railroad station.....March 1935 p. 11
(Gas replaces coal, reduced fuel cost pays for
new equipment.)
Bakers Weekly
Humidity in the oven chamber.....May 25, '35 p. 41
(Some new boiler specification constants are
available for bakers' use.)

Power Plant Boilers E-2

- Gas Age-Record
New precision combustion control for boil-
ers.....Feb. 9, '35 p. 117
Amer. Gas Assoc. Mo.
The importance of gas fuel in modern power
generation.....July 1935 p. 277
Industrial Gas
New precision combustion control for boil-
ers.....March 1935 p. 17

HOTELS AND RESTAURANTS—H

- American Gas Journal
Methods of retaining the commercial cook-
ing load.....March 1935 p. 31
(New England experience with oil competi-
tion.)
Gas Age-Record
The status of commercial load in natural gas
territories.....May 11, '35 p. 475
Outfitter
Modern insulated ranges make for real econ-
omy.....April 1935 p. 21
Outfitter
Modernize the nation's kitchens.....June 1934 p. 33
Western Gas
Cooperate hotel and restaurant gas range
sale.....March 1935 p. 30
(Sales promotion methods. Shrinkage test
showing effect of temperature.)

LOW TEMPERATURE BAKING AND DRYING—I**Core Baking I-1**

- Industrial Gas
Fuel economics of baking foundry cores.
Part 2.....May 1935 p. 21
(Coke vs. gas.)

CERAMICS—J**Glass J-1**

- Ceramic Industry
Combustion of natural gas in glass furnaces.....April 1935 p. 217
(Velocity and port sizes required determined by
experiment. Full luminosity obtained by dif-
fusion flame.)
Glass Industry
Heat balance of a glass tank.....Jan. 1935 p. 5
Industrial Gas
Automatic production is important factor in
glass container plant.....April 1935 p. 15
(Regenerative glass tank and annealing lehr
on natural gas.)

Brick J-2

- Bulletin Amer. Ceramic Soc.
Firing clay refractories with by-product coke
oven gas.....Aug. 1935 p. 245
(550 B.t.u. gas gives a better looking product
and more uniform firing than with use of
coal. Details of kiln firing schedule are given.)
Western Gas
Ideal gas consumption curves for brick fir-
ing.....Apr. 1935 p. 15
(Regulate burner consumption to prevent over-
heating arches and to control quality of
brick.)

Vitreous Enameling J-3

- Bulletin Amer. Ceramic Soc.
A note on the effect of annealing on reboil-
ing of porcelain enamels.....Jan. 1935 p. 13
(Annealing at 900 to 1000 deg. F. prevents
reboiling.)
Bulletin Amer. Ceramic Soc.
Review of research on reboiling during the
past year.....Jan. 1935 p. 14
Gas World
Application of industrial gas.....Mar. 16, '35 p. 15
(Diffusion flame heating system for muffle fur-
nace.)
Gas World
Reconditioning and enameling black cookers.
Indus. Suppl.....Apr. 20, '35 p. 9
(Refractory radiant tube oven furnace shows
advantages over muffle type.)
Industrial Heating
A study of certain factors affecting the
proper firing of porcelain enamel on steel
or iron.....June 1935 p. 293
(Vented and non-vented operating conditions,
temperatures and atmospheres.)
Iron Age
Copperheads or iron oxide defects in por-
celain enamel.....Aug. 15, '35 p. 30
(Factors causing defect. Heating rate is im-
portant.)

Pottery, Chinaware, etc. J-5

- Ceramic Age
Modernizing the oldest mechanical art....Jan. 1935 p. 7
(Walking bean conveyor, direct gas fired kiln.)
Ceramic Age
Kiln operation at plant of the Salem China
Company.....Aug. 1935 p. 50
(Periodic kilns replaced with circular type
glost kiln and straight line tunnel kiln.)
Industrial Gas
Trends in pottery.....Jan. 1935 p. 43
(Circular kiln application.)
Industrial Heating
Unique kiln installation.....Jan. 1935 p. 43
(Circular kiln, dryers and tunnel type deco-
rating kiln.)

Terra Cotta, Sewer Tile, Refractories J-6

- Jour. Amer. Ceramic Soc.
The water smoking period and its control...Apr. 1935 p. 113
(Control of dew point of kiln gases necessary
to fire quality ware.)

Miscellaneous J-7

- Bulletin Amer. Ceramic Soc.
Efficiency of kilns.....June 1935 p. 194
Bulletin Amer. Ceramic Soc.
Effects of combustion methods on temper-
ature uniformity of kilns and furnaces....June 1935 p. 197

TEXTILE INDUSTRY—K

- Industrial Gas
The theory and practice of fabric drying...Apr. 1935 p. 21
(Apparatus for tenting and other drying op-
erations.)

TECHNICAL SECTION

C. A. HARRISON, Chairman

H. W. HARTMAN, Secretary

F. A. LYDECKER, Vice-Chairman

New Maintenance Unit Improves Service

THE Brooklyn Union Gas Company, serving a territory in which there are 2,197 miles of main, 329,172 services, and with approximately 75 per cent of the streets paved, presents the problem of commensurate maintenance costs.

Early in 1933, considerable pioneering was done in designing a mobile unit that would complete more efficiently repair jobs to mains and services.

In July, 1933, the first maintenance unit was put in service. The unit consists of a 157" wheelbase, 1½ ton chassis, on which is mounted a specially designed body, with pipe rack, barricades and compartments for the various types of tools required for gas company street work, as shown in the photographs.

Air Compressor

Immediately behind the cab there is mounted a 2-cylinder vertical air-cooled compressor, which is driven by a split propeller shaft power take-off through five V-shaped belts. This compressor has an output of 140 cu.ft. of free air at 650 R.P.M. and at 750 R.P.M. the output reaches 160 cu.ft.

In the specially designed body one compartment contains the hose reel carrier for the operation of the pneumatic tools. These consist of two pavement breakers, wall drill, digger, tamper, caulking hammer, grinder and a reversible close quarter drill which operates a tapping machine and a pipe threader.

For night work the unit is equipped with a small generator from an additional power take-off. This generator will develop 250 watts at 110-120 volts at the idling com-

By F. M. ROESCH
Superintendent, Street Division
The Brooklyn Union Gas Company

pressor speed. For lighting purposes five portable ditch lights of 50 watts each can be used.

This generator also makes it possible to operate electric tools within its capacity.

The unit is equipped with a standard gas mask and leak detector.

The working force of the unit consists

of an operator and an assistant, who also drives the unit. These men are capable of performing any type of street work.

It is planned to use these units for all emergency operations in addition to the regular repair work, thereby making it possible to effect permanent repairs promptly.

The advantages of using units of this type for gas company street maintenance work are obvious. We have found that the performance of these units justifies the plan to add from time to time to the fleet of 5 that we now have.



MARKETS FOR GAS

(Continued from page 357)

work directed toward this end is well under way. Such units were under test this summer and, in all probability, will be placed on the market for next season's business.

Another possibility, when using cooling alone for the whole summer air conditioning job, is generating this cooling with gas by means of steam jets or by absorption refrigeration. Where large high pressure boiler loads are on gas the steam jet method is a practical means of securing air conditioning business. Satisfactory equipment capable of taking care of both large and small installations is available and a high degree of satisfaction is possible. The necessity for high pressure steam is a limitation, however, that cannot be overlooked. Large absorption gas refrigeration machines are not entirely practical devices yet, but they are now going through the development stage.

A third method of summer air conditioning with gas is to entirely separate the dehumidifying load and the cooling load. Many experts believe that this method, which is distinctly a development of the gas industry, offers a quality of air conditioning which is superior to that generally offered when refrigeration alone is used. While it is possible to get any resultant temperature and relative humidity with a properly operated plant using refrigeration only, certainly these plants are, because of increased operating cost and complication of controls, rarely so operated.

Split System

In the so-called split system where dehumidifying and cooling are done separately, gas heat can be used in direct dehumidifying machines and the most suitable relative humidity is thus obtained in a very simple manner and at low cost. With proper humidity assured at all times, the need for the low cooling temperatures used in most plants does not exist. Comfort is attained with a surprisingly slight drop in temperature. This supplementary cooling can be secured by several methods including direct water coils, refrigeration or evaporative cooling. The choice depends upon local condi-

tions. But an important fact to bear in mind, is that when cooling air that has first been dried, much greater capacities can be gotten from given sizes of refrigerating machines and the cost per ton of operating them, whether motor or engine driven, is proportionately reduced. This is due to the fact that the extremely low evaporator coil temperatures required on all full refrigeration jobs are not needed, more moderate temperatures being sufficient.

With a higher quality of air conditioning and the possibilities of lower operating costs, there appear to be reasons why dehydration air conditioning using gas will be an increasingly important factor in building desirable summer load.

Industrial Drying

There are many electric industrial summer air conditioning jobs that have no more need for cooling than an Eskimo has for a fan. When properly analyzed these are found to be dry air jobs and cooling is simply expensive excess luggage. Direct gas dehydration has a chance to almost monopolize this class of industrial drying. In such instances, gas dehumidifying is not only the most simple and satisfactory means of air conditioning but the least expensive. Industry is finding this out. Gas equipment for direct dehumidifying and using either solid or liquid adsorbents is not being installed in residential, commercial and industrial buildings. The cost of equipment is getting down to a competitive basis with electric equipment. The public is beginning to appreciate the increased comfort for humans and the closer control in manufacturing operations that are possible when wide daily variations in humidity and temperature are subject to independent treatment and control.

I believe that industrial and commercial gas service are on a sound basis of acceptance by the public. Let us for a moment compare combined natural and manufactured industrial and commercial gas sales with industrial and commercial electric sales. These figures are for the United States. Using 1929 as an index of 100, we find that both gas and electricity dropped, each reaching a low in 1932. The gas index for 1932 was 72.8 and

the electric index was 76.8. But we have recovered to a greater extent. By the end of 1934, we had reached an index of 91.9 while the electric index was 87.2. But on top of that, industrial and commercial gas has shown for the first six months of this year over the same period of last year, an increase of 9.9%; while the corresponding increase in electric sales was 6.6%. The contribution of this State to that record has been an important one, California increase in natural gas sales during the first six months of this year being 18.9% greater than for the first half of last year. These figures seem important, because they indicate that we can get load and can hold it.

The important contribution to safety in particular and to better performance of gas appliances in general, which has been made by the Laboratory Approval program is, of course, well known to all of you. The Pacific Coast Laboratory and the Cleveland Laboratory have tested 8,500 basic models of appliances and from such tests extended approval to 16,000 other similar units. I sometimes find it difficult to comprehend what it means in terms of public safety, in improved service to our customers and in increased security for our business, for this industry to have assurance that, before they are shipped, every unit of over 24,000 models of gas appliances has met American Standards for safety and reasonable performance. As the percentage of approved appliances connected to the lines increases, the favorable effect on the general level of safe and satisfactory utilization is cumulative.

Testing Commercial Appliances

The standard domestic gas appliances are all covered by Approval Requirements and over 90% of all domestic gas appliances sold in the United States and Canada are of approved types. It is only recently that requirements for certain classifications of commercial appliances have been prepared and testing of these appliances undertaken. The same is true regarding listing of accessories. The latest classification of commercial appliances is multiple hair dryers, and a representative committee of manufacturers and utility engineers early

this month completed the draft of Approval Requirements for these new and fast selling gas using devices.

One of the Association's activities which has been put to extended use by the entire industry, especially gas fitters and plumbers, has been the work of a special committee charged with the preparation of manuals covering the installation, adjustment and servicing of various gas appliances. The first volume covered domestic gas ranges and was shortly followed by another volume on water heaters. Thousands of copies of these have found their way, not only into the hands of gas companies for the education and training of fitters and service men and for reference purposes, but the plumbing industry has subscribed very heavily to them.

At the present time, a similar manual on commercial kitchen servicing is under preparation. This will be ready about the first of the year.

Domestic Appliance Research

Despite the splendid progress that has been made in keeping gas appliances up to date and despite the effective sales and promotional efforts of gas companies, manufacturers and dealers, together with a downward trend in rates, the sales records of domestic gas have caused many executives to critically review the competitive position of gas in the home. It has been found that domestic gas is facing keener competition, particularly from electricity and that this competition is brought about by improvement in electrical equipment, by lower electric rates and by aggressive sales tactics on the part of our competitors. Competition has been felt, as you know, not only with cooking but with water heating, the two standbys of our domestic load. This situation has called for a broad and complete appraisal of the position that domestic gas appliances occupy today and an accurate understanding whether such apparatus can keep us abreast of, or preferably ahead of, conditions that we must face in the future. For this purpose, the American Gas Association has recently appointed a Committee on Domestic Gas Appliance Research of which Thomas E. Roach of Seattle is an active member. This committee

has taken full cognizance of the splendid advances that have been made by manufacturers in designing and building domestic appliances and has carefully reviewed the improvements in construction, performance and dependability that have steadily taken place since the Laboratory Approval Requirements were first drawn up ten years ago. The committee is giving detailed consideration first to the gas range.

Range Efficiency

In considering the gas range, it is clear that it possesses certain advantages that have stood us in good stead and which will continue to do so. On the other hand, there are some facts, that close investigation has revealed, which show that it is possible to bring about a substantial general improvement and more uniformity in performance of oven sections, broiler sections and top sections of domestic ranges. I refer to such matters of which the consumption per cu.ft. of oven space is an example. To reach 500° in some ovens only 1400 B.t.u.'s are needed. But in other ovens, as high as 2400 B.t.u.'s must be supplied. And it is not necessarily the uninsulated ovens that have the highest figures. And again, some ranges will heat up to 400° in six minutes, while others require twelve minutes. Likewise in those instances, it is not necessarily uninsulated ovens that produce the highest figures. Holding consumptions for each cu.ft. of oven space (at 500°) varies as great as from 2690 B.t.u.'s to 4750 B.t.u.'s for insulated ovens and up to 5600 B.t.u.'s for some uninsulated ovens.

With broilers it has been found that the effectiveness of putting B.t.u.'s to work varies as much as 262%.

Twelve ranges taken from the sales floor of a single gas company showed that efficiencies of top burners, when using one size vessel, vary from 20% to 33%. With another size vessel efficiencies varied from 37% to 44% and with still another size from 40% to 55%. This certainly seems to be too great a variation, and the objectives of the Research Committee are to not only bring all efficiencies to the highest point which now seems attainable but to still further increase these efficiencies above that point. Don't

overlook the fact that the general level of present-day efficiencies show a marked increase over those of five and ten years ago.

Another problem in connection with ranges is that existing oven burners will not always permit of thermostats holding temperatures as low as 250°. To overcome permanently this limitation will, in my opinion, require some intensive work on low-temperature combustion that will carry our knowledge of such phenomena considerably beyond its present point.

The research work on domestic ranges has been under way for three months. It is always unsafe to predict the results of research, but I think that ways will be devised to overcome the wide variations in performances now noted, that efficiencies in general can be raised and that the time element in oven and broiler heating can be materially improved. Manufacturers can be depended upon to keep the style element of gas ranges fully up to date. That they are determined also to keep the engineering features up to requirements is shown by the increase in the number of technical men being brought into gas range factories.

Responsibility to Consumer

In developing gas utilization apparatus there are problems involved which do not arise in development work in some other utilities. All of us are watching with the keenest interest the development of new railroad trains, new trolley cars, trackless trolleys, busses and telephone equipment. The type of service they render and the public acceptance they receive is solely in the hands of the companies themselves because they retain ownership in the apparatus and they are the ones who operate them. We too must develop apparatus that will render the highest grade of utility service, but we must, in addition, always remember that gas utilization apparatus will not be operated by the gas companies but must be sold to and operated by our customers. As a consequence, our problem, unlike that of some other utilities, is to make sure our customers secure entirely satisfactory results under a wide variety of conditions when operating gas equipment themselves

on their own premises. Also the diversity of apparatus which we must provide far exceeds that which railroad, trolley, bus and telephone utilities provide for their customers' use. In our development work we cannot afford to overlook this added responsibility we have to our customers, but it certainly complicates our problem.

I have noted with a great deal of satisfaction the gradual merging of natural and manufactured gas utilization practices. Each branch has had something to offer the other. Natural gas has inspired manufactured gas men with the urge to get larger industrial and domestic loads and has frequently pointed the way in which this could be done. Manufactured gas men who, through necessity in the past, have had to make every B.t.u. count, have pointed out the need for always working toward the highest utilization efficiencies. Both are contributing through research and development to a higher level of utilization.

Offensive Research Urged

I believe that on the whole not a sufficient proportion of our industry's research and development effort is expended on offensive research, as contrasted with defensive research. When the time arises for research to be called upon as a defensive measure there seems to be no difficulty in providing a program and the necessary funds can generally be raised. Unfortunately, this is not always the case in connection with offensive research. But the industry should not overlook the fact that the soundest development program is one based on having our research and most of our development completed *before* the heat using practices of our customers change. It is expensive to buy a lock after the horse has left the stable. Sometimes the horse cannot be found and brought back.

We are now dealing with more intelligent industrialists and also with more intelligent home owners. They are continually planning things that affect our business. A man prominent in one of the largest heat using industries last month addressed a group of his business associates as follows:

"Firing constitutes from 2% to 10% of production costs, yet incorrect firing causes most of your product losses and,

in altogether too many instances, a product that is decidedly and unnecessarily inferior in quality to competitive products."

What is our answer to that man and to hundreds more like him? There can only be one answer if we are to continue to hold what business of his we now have and then secure a larger proportion of his total business. We must continually make the combination of gas heat and gas burning equipment so suitable to his needs and so attractive to him that there will be left no doubt as to gas being his first choice fuel. I think that can be done.

KEEPING METER RECORDS

(Continued from page 374)

with the book will lose considerable time trying to honor instructions. Watch the "get early" especially.

Safety Hazards

Safety hazards are shown on sheets to warn the readers. Several companies have procedures to eliminate these hazards gradually, both by customer cooperation and other means.

Regardless of changes in customers, safety notations should never be altered or canceled, until definite instructions to do so are received from the proper authority. Even the "bad dog" notation should remain. The new customer may have two of them. Let the reader decide.

Information Sheets

Some companies use information sheets, filed in the front of the book listing by folio or other identification, all accounts bearing special instructions. This relieves the reader of paging the binder to locate accounts to be handled by other than regular routine. When placing or canceling notations on the meter reading sheet the clerks should change the information sheet accordingly.

Memory Files

With the fast increasing application of memory or tickler files to all office functions, it is assumed that meter record work justifies an individual file. In addition to housing routine memorandums, it is recommended that the file be expanded to include temporary jobs. It is often necessary to release an original record to another department for some action. Billing or other procedure may be held up pending the return of the record. Occasionally a report is filed without clearance to the Meter Record Department. This may result in duplication of effort or an "open" account for an indefinite period.

Condition of Records

The condition of the binders is primarily the responsibility of the meter record clerk. Torn sheets should be mended or replaced; loose or broken binders adjusted or repaired; misfiled sheets placed correctly. The binders should always be in the best of condition for both office reference and meter reading.

The trend today is to have one record travel through interested departments, instead of distributing several copies. Practically all of the work handled by meter record clerks is representative of this system. Rarely do they receive a paper or card, which has not been subscribed to by many individuals. This naturally causes difficulty because of so many different types of handwriting. Not only are the records they receive complicated but eventually the reading sheets become soiled and dog-eared.

Soiling may be avoided to some extent if pencils and ink which do not blur are used. Stiff binder covers slightly relieve the dog-eared. It is appropriate, while referring to the latter condition, to caution against the habit of dampening the finger to page the binders. These sheets come in contact monthly with more people and more places than any other record. To prevent infection it is advisable to use a rubber finger or the eraser on the lead pencil, if this method of paging is employed.

Conclusion

Meter record work justifies a prominent place among key positions in customers' accounting. It is a sort of stabilizer.

With the rapidly growing tendency to show credit history, classifications, security and other information, the reading sheet is fast becoming a composite picture of an account. Thus, the meter record clerks have excellent opportunities to familiarize themselves with the work of other departments. Experience is available in many forms. Future assignment in customers' accounting or customers' service work reflects the experience gained. This type of work is constantly changing; it is never in the "groove." This naturally captures the interest.

GAS SALES AS AFFECTED BY TEMPERATURE

(Continued from page 361)

requiring the extension of the curve as indicated by the dotted lines. There is no hard and fast rule for these extensions, except that they should reasonably conform to the general pattern of these curves as indicated by the plotting of several years on the same chart. As in any engineering problem a certain amount of judgment is required based on experience.

After the transition from actual 30-day sales per consumer to normal is accomplished for any year, a comparison of the two sets of values may be made visually by presenting them in the form of Chart 3, where both sets of values are plotted on a base of 12 monthly divisions. The extent to which the actual sales per consumer runs over or under the normal is here visible at a glance.

(The second part of this article will appear in a later issue.)

Personnel Service

SERVICES OFFERED

Public Relations: advertising, publicity, complaints, public contacts, editing of employees' magazine, photography, six years. Industrial development and research; all details including surveys of various cities, towns and counties. Compilation and editing of data, marketing surveys, economic studies, four years. Merchandising; systematizing and coordination. 968.

Manager-Executive:—18 years' practical operating experience in all phases manufactured gas industry. Technical; university training. Particular emphasis and success in merchandise sales, load building, public relations; desires connection with straight gas utility in general or sales management capacity. Go anywhere; (40) married. 969.

Engineer:—Nine years in gas industry. Now employed as manager of small property. Desires position as Assistant Engineer of large property or industrial gas sales work with appliance manufacturer. 970.

Ambitious advertiser, 31, seeks position where initiative coupled with varied experience in industrial and public utility fields may command recognition. Knowledge accounting, statistics, business administration, security sales work and record keeping. 971.

Mechanical Engineer; thorough research and production experience in all phases of manufactured gas distribution. Knows modern meter work (tin and iron) from treating leather to improving fast meter records; elimination of gum, etc. troubles; customer contact; languages, desires responsible position in distribution or with manufacturer; U. S. or foreign (31), married. 972.

Graduate Chemical Engineer desires position with operating or holding company, where six years' experience manufacturing coal and water gas, two years' experience operating meter repair shop and complaint department, and one year with house heating sales and engineering experience, can be of material assistance in lowering cost. 973.

Engineer, thoroughly experienced in appliance problems with manufactured and natural gas, desires position with manufacturer or gas company. Record includes ten years' research work in laboratories of national scope, five years' development of domestic appliances and controls; also sales. 975.

Executive, with many years' experience in the gas industry; graduate in Mechanical Engineering with practical experience in gas plant design, plant construction and maintenance. Thorough knowledge of operating, new business relations, industrial fuel and house heating applications. 976.

Distribution Superintendent—Gas Engineer. B.S. and M.S. degrees, major in Gas Engineering. Four years' "dirt" experience high- and low-pressure distribution operation; two years' distribution superintendent of industrial territory (23,000 meters) including meter repair, appliance department. Completed Alexander Hamilton modern business course. (30). 977.

Gas Engineer (37). Early technical training chemical engineering, nine years' chemical research gas analyses, fuels and gasoline adsorption. Eight years' active in gas engineering in charge of plant construction, inventory and appraisal valuations. 978.

Engineer with utility accounting experience. B.S., M.E.E.; postgraduate work. Three years' research assistant, National Industrial Conference Board. Twelve years' gas and electric utility experience, rates, franchises, cost allocations, contracts, research in utility management problems. Experience with P.S.C. accounting. (N.Y.). 979.

Controls and gas burner engineer wants position offering greater possibilities. Has several years' practical work in design, application and operation thermostatic and gas mixing controls or mechanical and electrical types, and gas burners all types. Fundamental training and experience, combustion, metallurgy, mechanics and electricity. 980.

Sales Engineer having specialized in the sales and promotion of automatic gas water heaters for over 10 years. Planned and conducted many successful sales campaigns. Well acquainted with gas companies, plumbing supply houses and have arranged many eastern plumber dealer setups. 981.

SERVICES OFFERED

Specialist in problems pertaining to efficiency, operation and maintenance; well grounded in the fundamentals of fuel production, transmission and distribution. Have proven record for load building, new business and fuel application. Experience also covers appraisal, rates, selling and public relations; graduate engineer. 982.

Accounting, Cost and General. Eight years' experience; gas plant, transmission and distribution system construction and operations analyzed. Ascertainment of cost, accounting of same determined in conformity with utility and public service commissions requirements. Field records gas works and main systems audited and accounting and statistical reports compiled. 983.

Assistant Superintendent of coal gas plant desires position with a coke oven or coal gas plant in supervisory capacity. Three and one-half years university training in civil engineering; eight and one-half years' experience in coal gas plant. Familiar with plant construction work. (29) Married. 984.

PERSONNEL PRIMER

Q., What is A. G. A. Personnel Service?
A., An activity whereby employers and prospective employees may be brought together; available to all members.

Q., Is Personnel Service new?
A., Personnel Service has been extensively used by the industry for the last 23 years.

Q., How does Personnel Service function?
A., Principally by an advertisement supported by filed details of education, qualifications and experience.

Q., To what extent is Personnel Service confidential?
A., Thoughtful handling of all communications is given with a view to preserving the confidence of both the organization and the individual. The identity of a "positions open" advertiser is never revealed without written permission; in the case of "services offered" the advertiser's best interests are watched in all communications.

Q., What is the Confidential Classification Record?
A., A form which shows, comprehensively but concisely, education, personal and technical qualifications.

Q., How is the Confidential Classification Record used?
A., Either by sending it, upon request, to employers who are not yet ready to communicate with the advertiser, or by submitting records of men possessing specified qualifications.

Q., What about the advertisement?
A., The "Services Offered" advertisement receives a serial number in order of its receipt, is limited to fifty words and replies are forwarded promptly to the advertiser.

Presently employed. Available thirty days. Do you need a gas man who can get results? I am willing to prove it by a year's trial. Experienced thirteen years in gas business sales promotion, making friends, boosting sales, creating company good will; can help sales force get new business. 985.

Manager. 20 years' experience managing water gas properties. 3 years' experience managing natural gas property. Experience includes all phases including distribution, new business and public relations. 986.

Manager or Superintendent. Twenty years' practical experience handling properties having up to 4,000 meters. Water or coal gas plants. Have had good success in rebuilding run down properties. Would take a living wage and share of profits, married (50). 987.

Sales Manager or Manufacturers Representative. Nine years' experience in retail and wholesale merchandising of major appliances. Capable of organizing and directing sales personnel. Extensive acquaintance among eastern utility merchandising managers. Travel or locate anywhere. 988.

Graduate Mechanical Engineer desires position in any department, thorough, capable. If you want a live wire who can get results either in distribution manufacture or sales, glad to arrange personal interview at Chicago convention. Natural gas experience including house heating. 989.

SERVICES OFFERED

Research Chemist—Several years' experience in a coke plant together with research and development work for leading research corporation. Familiar with analyses of by-products and routine analytical methods. Now employed but desire a change. 990.

Utilization and Sales Engineer long experience New York Metropolitan and adjacent area in house heating, water heating, restaurant and industrial work. Testing installation and servicing. 991.

Gas Engineer desires new connection. Graduate chemical engineer. Fifteen years' experience in design, construction, operation and maintenance of Water Gas Plants and high-, medium- and low-pressure distribution systems. Able assistant large, or manager medium size property. 992.

Gas range and Appliance salesman seeking substantial connection. Thoroughly experienced and capable of handling any territory. Have the ability to supervise and perform sales promotion duties. Will locate anywhere, no preference as to territory. Interested in salary and expenses or drawing account, commission and expenses. 993.

Gas Engineer. Ten years operating all types of plants, various capacities from cadet to superintendent. Six years, gas manufacturing equipment company, last three chief engineer. Three years with public service commission, valuation engineer. Experience ideal for holding or operating company engineer; interview at A. G. A. Convention. 994.

Sales Manager—Sales Promotion Manager—Salesman—competent, aggressive, experienced,—for gas company or manufacturer wanting successful sales. Appliances, gas merchandise, gas distribution supplies, plumbing, heating specialties. 12 years' effective selling, promoting, advertising, managing volume sales for leading specialty manufacturers. National gas company executive, jobber and consumer contacts. 995.

Office Manager (31) 3 years in company of 46,000 meters, 14 years' experience in clerical and accounting work, will accept position in any capacity—collector, accountant, storekeeper, payroll work, etc. Married. 996.

Industrial Sales Engineer—Several years' experience in supervising the sales, installations and maintenance of house heating, industrial steam and water heating. Special training and knowledge derived from long experience with eastern utility companies will be a great asset to any corporation or manufacturer interested. Married. 997.

Married man with more than twenty years' experience in coal and water gas manufacture, high and low pressure distribution, also natural gas production and distribution, desires position as Manager. 998.

Gas minded, practice trained water gas plant man (39). Experience ranged from sole operator 4-foot plant to assistant superintendent of a 3½ million daily plant. Also experienced as general foreman of distribution construction, mains and services. 999.

Energetic efficiency gas man with twenty years' experience, operating and managing, desires change from present position, to that of manager or superintendent of medium sized utility or assistant to manager of large one. Knowledge of sales problems. Single, college, go anywhere. (39). 1000.

Gas Technologist—Young man (34) with broad experience in gas industry as manufacturing and distribution engineer, operator and designer of equipment, desires responsible position where valuable engineering and business experience can be put to use. Ability in selling has been demonstrated. 1001.

Sales Engineer, thoroughly experienced in new business operations of gas utility, domestic appliances, house heating and industrial application, wants position where there is chance for advancement. 1002.

Engineer (27) B.S. Chemical Engineering 1932; 1-year graduate study. Experiences: 18 months automotive industry; 3 months gas pipeline; 22 months gas appliance industry where now employed. Desires position as Cadet Engineer. 1003.

Sales Supervisor or Sales Engineer. Have had considerable experience in industrial, commercial, house heating and domestic sales work. Also am familiar with design and installation of equipment. Have worked with manufactured and natural gases. University graduate and married. 1004.

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